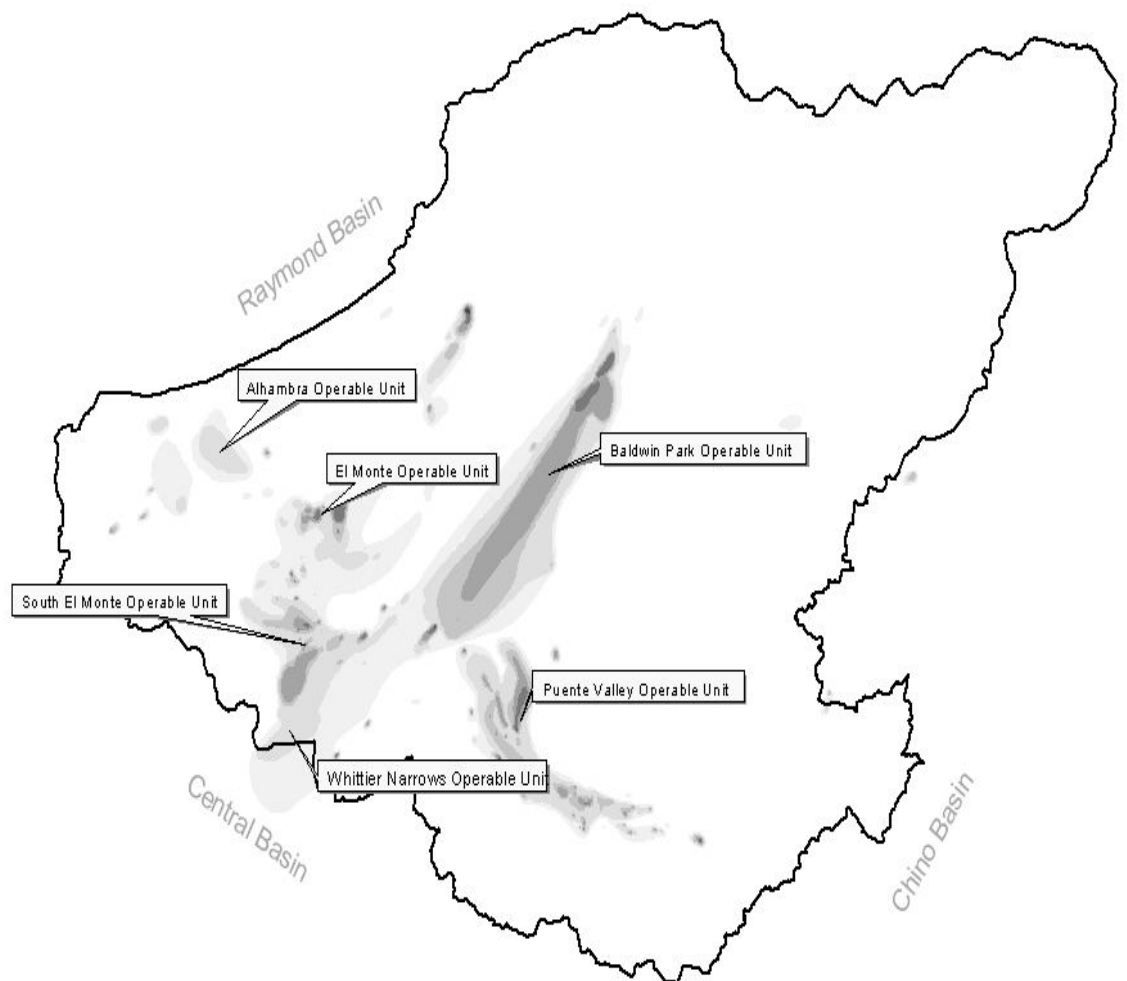

JANUARY 2004

State Water Resources Control Board

REPORT TO THE LEGISLATURE



ACTIVITIES OF THE SAN GABRIEL BASIN
WATER QUALITY AUTHORITY
1992 THROUGH 2003



STATE OF CALIFORNIA

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State of California
STATE WATER RESOURCES CONTROL BOARD

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EXECUTIVE SUMMARY

The San Gabriel Basin Water Quality Authority (WQA) is a local entity created in 1992 by Senate Bill (SB) 1679. This bill recognized that the groundwater contamination issues affecting the San Gabriel Groundwater Basin (Basin) were complex and required expedient cleanup. The Basin is listed as a Superfund site on the United States Environmental Protection Agency's (USEPA) National Priority List (NPL). Over one million residents in the Basin rely primarily on these local groundwater resources for their potable water supply.

A subsequent re-authorization bill, Assembly Bill (AB) 2544 (Calderon, 2000), requires the State Water Resources Control Board (SWRCB), on or before January 1, 2004, to report to the Legislature on progress made by the WQA, and any recommendations for improving the progress of the authority.

The WQA was created to coordinate response actions to the contamination in the Basin with all stakeholders. Stakeholders include, but are not limited to, the USEPA, the U. S. Bureau of Reclamation (USBR), the Department of Toxic Substances Control (DTSC), the SWRCB, the Los Angeles Regional Water Quality Control Board (LARWQCB), the Department of Health Services (DHS), the WQA, the Main San Gabriel Basin Watermaster, cities affected by the Basin's groundwater contamination, water purveyors in the Basin, and the Potentially Responsible Parties (PRPs).

The San Gabriel Valley Superfund Site is subdivided into Operable Units (OUs). The OUs include Baldwin Park, El Monte, South El Monte, Whittier Narrows, Puente Valley, and Alhambra. The WQA has been instrumental in the implementation of remediation projects in most of the OUs. Additional remediation projects have been implemented in Non-Operable Unit areas within the Basin, such as, the City of Monrovia and Amarillo Mutual Water Company. Most projects have included the installation of groundwater wellhead treatment facilities, the funding of groundwater treatment systems, and the installation of new drinking water production wells.

The WQA's goals are to: 1) Accelerate removal of contaminant mass in the Basin; 2) Prevent migration of contaminant into critical groundwater supplies; 3) Integrate cleanup with water supply; and 4) Minimize economic impact to the public.

To expedite cleanup and contain groundwater contamination, the WQA encourages technical and financial partnerships and considers providing financial support to remedial activities that can expeditiously be implemented. If partnerships cannot be voluntarily formed in a timely manner, the WQA seeks ways to move forward and implement the necessary cleanup while considering all options to require financial participation from those responsible for the contamination. Where appropriate, the WQA combines groundwater cleanup objectives with water supply needs.

A considerable degree of coordination among the WQA and federal, state, and local regulatory agencies has occurred since the WQA was formed. There are, however, important areas that need to be addressed. First and foremost is the need for more transparency to assure that this quasi-governmental agency is held to the same accountability standards as its sister regulatory agencies. To gain a clearer view of the WQA's contribution to groundwater cleanup efforts in the Basin more information needs to be shared with stakeholders with regard to the rationale used to prioritize funded projects and what corresponding benefits have been realized.

The WQA must be applauded for funding much needed groundwater remediation infrastructure projects to provide drinking water and restore the basin's beneficial uses for groundwater. The focus should now shift to contaminant mass removal. Based on information provided by the WQA (Table 1), the WQA has spent about \$98.7 million (capital costs, operation and maintenance {O&M}) to remove 26,000 pounds of volatile organic compounds (VOCs) from the impacted aquifers in San Gabriel Basin between 1992 and 2003. Though these costs will be amortized over many years, O&M costs may increase in the long-term due to the uniqueness of the contaminants and the remedial technologies used.

1. INTRODUCTION

1.1. POLICY STATEMENT

The WQA was created by state legislation (Appendix A – SB 1679, Russell, 1992, San Gabriel Basin Water Quality Authority Act [WQA Act]). The legislators recognized that: 1) the groundwater contamination issues in the Basin (Figure 1 – San Gabriel Basin Contamination) were complex; 2) the response from the USEPA alone may not adequately address the urgent needs or incorporate local issues; and 3) over one million residents rely primarily on the Basin for potable water supplies. The WQA was created to complement the USEPA Superfund process by facilitating and assisting in the planning, financing, and construction of groundwater treatment facilities in the Basin and putting the water to beneficial use.

1.2. BACKGROUND INFORMATION

1.2.1. OVERVIEW OF GROUNDWATER CONTAMINATION

The groundwater in the Basin is contaminated from ground disposal, dating back to World War II, from synthetic organic compounds used primarily as solvents in industrial and commercial activities.

High concentrations of VOCs were discovered in a groundwater production well in the Azusa area of the Basin in 1979, near a major industrial complex. Further investigation revealed that widespread VOC groundwater contamination had significantly impacted the Basin. This discovery led USEPA on May 9, 1984 to place four portions of the Basin on the NPL under authority of the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), also known as the Superfund program.

Unfortunately in 1997, newly detected emergent contaminants including perchlorate and n-nitrosodimethylamine (NDMA) from liquid/solid rocket fuel along with a VOC stabilizer chemical called 1,4-dioxane, complicated and delayed groundwater cleanup progress. Most notably affected was the largest geographical area of the San Gabriel Valley Superfund site known as the Baldwin Park Operable Unit (BPOU). This led USEPA, state, and local agencies to conduct further investigation of the sources and to evaluate treatment technologies available for remediating contaminated groundwater.

More recently, increased levels of perchlorate have threatened other areas of the Superfund site, namely the South El Monte Operable Unit (SEMOU) and the Puente Valley Operable Unit (PVOU).

1.2.2. OVERVIEW OF WQA AUTHORITY

The WQA was formed by a special act of the California Legislature (Appendix A). The WQA Act gives the WQA authority, *inter alia*, to plan for and to coordinate among several agencies with authority affecting cleanup of the Basin. The WQA Act requires the WQA to develop and adopt a basinwide groundwater quality management and remediation plan that includes:

- 1) characterization of the Basin's contamination;
- 2) development and implementation of a comprehensive Basin cleanup plan;
- 3) financing of the design, construction, operation, and maintenance of groundwater cleanup facilities;
- 4) provision for a public information and participation program;
- 5) coordination with federal, state, and local entities; and
- 6) consistency with the National Contingency Plan, any applicable USEPA records of decision, and all LARWQCB requirements.

1.2.3. HISTORY OF WQA PLANNING

The WQA first adopted a *Basin-wide Groundwater Quality Management and Remediation Plan in June of 1993*. This plan provided the guiding principles used over the following six years of early action projects to remove and contain contamination. The plan also characterized the extent and movement of contamination at that time. The WQA officially adopted the amended Plan on March 6, 2000. The pre-existing rules, regulations, and standards are Applicable or Relevant and Appropriate Requirements (ARARs) at the various OUs in the Basin.

1.2.4. WQA ORGANIZATIONAL CHART

(Appendix B – San Gabriel Basin Water Quality Authority / 2003 Organizational Chart)

2. WQA GOALS

Originally, the WQA goals were developed as a result of discussions with federal, state, and local agencies, various stakeholders, and comments heard at public workshops and hearings. Each year the goals are re-evaluated to determine applicability and whether any additional goals should be added. The goals have experienced some modifications through the years. Currently, the goals are:

- 2.1. Accelerate removal of contaminant mass in the Basin;
- 2.2. Prevent migration of contaminant into critical groundwater supplies;
- 2.3. Integrate cleanup with water supply; and
- 2.4. Minimize economic impact to the public.

2.1. GOAL 1: ACCELERATE REMOVAL OF CONTAMINANT MASS

Primarily engaging the regulatory processes of other agencies of the State of California fulfills this goal, and whenever possible, prompting the implementation of activities ahead of the time required under the applicable regulatory process. In the past, the WQA identified and focused its accelerated removal activities on projects that could immediately be implemented to remove contaminant mass. Due to the ever-growing list of impacted water supply wells, the focus has changed to the early implementation (early action) of several treatment facilities (Table 1 – Major Activities and Milestones). Water purveyors have constructed these facilities, individually and jointly, with the WQA and/or other agencies (i.e., Main San Gabriel Basin Watermaster and Upper San Gabriel Valley Municipal Water District).

More of these types of early actions are necessary to either: (1) remove contaminant mass to immediately prevent further degradation of downgradient aquifers; (2) contain the spread of contaminant to protect critical water supplies; (3) restore critical water supplies; or (4) combine the aforementioned.

Although early actions are implemented before a regulatory mandate, there has and will continue to be coordination with USEPA and LARWQCB to link the early actions to the eventual mandate. Several crisis situations exist within the Basin that demand this type of immediate action. Waiting on mandated actions has already shown to have severe financial impacts in many parts of the Basin.

The WQA must be applauded for funding much needed groundwater remediation infrastructure projects to provide drinking water and restore the basin's beneficial uses for groundwater. The focus should now shift to contaminant mass removal. Based on information provided by the WQA (Table 1), the WQA has spent about \$98.7 million (capital costs, operation and maintenance {O&M}) to remove 26,000 pounds of VOCs from the impacted aquifers in San Gabriel Basin between 1992 and 2003. Though these costs will be amortized over many years, O&M costs may increase in the long-term due to the uniqueness of the contaminants and the remedial technologies used.

2.2. GOAL 2: PREVENT MIGRATION OF CONTAMINATION INTO CRITICAL GROUNDWATER SUPPLY

In many parts of the Basin, the contamination continues to spread and threatens groundwater supply wells. The goal to contain the contamination is supported with actions that specifically address threats to groundwater pumping centers. Loss of major production centers will continue to impair the water supply unless these types of threats are immediately addressed in a cleanup plan. The threat from migrating contamination through the soil has been dramatically reduced by remedial actions directed by the LARWQCB and USEPA.

The WQA follows the existing rules and regulations of DHS and the Main San Gabriel Basin Watermaster, which govern the location and production of water wells for water quality purposes.

2.3. GOAL 3: INTEGRATE CLEANUP WITH WATER SUPPLY

With so much of the local water supply impaired due to VOC contamination, it is essential that impacted groundwater treated from the cleanup projects be returned into the drinking water supply system. These desired objectives are achieved by maximizing the use of existing water treatment facilities that have either been shut down or have been impaired. If new facilities are needed, they will be integrated into the drinking water supply of the appropriate water purveyor. Without maximizing the use of existing water treatment facilities, many water purveyors will be forced to build redundant well-head treatment facilities on impaired wells or look for an alternative drinking water supply, including surface water supplies from Northern California and the Colorado River. Currently, the predominant source of water supply in the valley is from the local groundwater. Despite the widespread areas of contamination, the Basin aquifer continues to provide approximately 90 percent of the domestic water supply for the one million residents.

The necessity to develop new sources and to fully utilize existing sources of groundwater is evident in recent court decisions within the state and the Colorado River Watershed. For instance, water available from the Colorado River is being reduced as Arizona and Nevada utilize more of their share.

The WQA intends to engage the existing rules, regulations, and standards of the Main San Gabriel Basin Watermaster, LARWQCB, and the DHS to promote the reasonable and beneficial use of water produced and treated under mandate from the USEPA. The WQA recognizes that a number of voluntary or consensual arrangements ultimately are required to implement the objective to integrate water cleanup operations and water supply operations in the Basin. Under the WQA Act, the WQA has authority to seek recovery of the WQA's cost to respond to and cleanup groundwater contamination in the Basin. These cost recovery efforts, though necessary, require more coordination with other regulatory agencies to exact equitable settlements or the avoidance of litigation altogether.

2.4. GOAL 4: MINIMIZE ECONOMIC IMPACT TO THE PUBLIC

To accommodate potentially conflicting goals between accelerating cleanup and minimizing impact to water rate payers, the WQA has identified high priority response actions that can be implemented ahead of USEPA's mandate using available financial resources, including federal reimbursement funding and financial participation from PRPs. Where the WQA is required to use its own assessment to quickly assist in the development of a project, the WQA always considers cost recovery actions to minimize cost borne by the public.

3. FUNDING

If funds cannot be generated from PRPs to begin an identified early action project, the WQA will work with individual purveyors, Watermaster and/or other local agencies to develop funding for the project using federal and/or state funds, the WQA member agency funds, including individual purveyors, and only if necessary, its own assessment. When federal or state funds are required, the WQA will provide the necessary accountability and transparency to demonstrate effectiveness.

3.1. POTENTIALLY RESPONSIBLE PARTIES

The WQA seeks to recover funds from those responsible for the contamination. If the process of acquiring those funds is unilaterally stalemating or stalling the project, the WQA moves forward without this source of funds to ensure necessary cleanup/water supply projects are implemented. In this event, the WQA may choose to initiate cost recovery actions (legal actions).

3.2. FEDERAL GOVERNMENT

Congress has authorized two federal programs specifically for the Basin. Both of these reimbursement programs are administered through the USBR directly to the WQA. The WQA adopted a set of procedures called the Federal Funding Program Administration (Appendix C – Federal Funding Program Administration by the San Gabriel Basin Water Quality Authority, revised March 11, 2003) to guide the allocation process for both programs.

3.3. SAN GABRIEL BASIN RESTORATION FUND

The United States House of Representatives passed HR910, The San Gabriel Basin Water Quality Initiative that was introduced by Congressman David Dreir on March 2, 1999. The authorization of the “Restoration Fund” will provide \$75 million in support of groundwater cleanup in the San Gabriel Basin. In addition, this bill will allow WQA to use federal funds to promote consensus cleanup efforts at the local level for the contamination in the San Gabriel Basin. The Restoration Fund will also provide \$10 million to prevent the spread of pollutants into the Central Basin and \$25 million for national research into more cost-effective methods for cleaning up contaminants, such as perchlorate. To date, a total of \$49 million has been appropriated and allocated to cleanup projects throughout the Basin.

This program requires a 35 percent non-federal match. Non-federal funds are classified as funds that are not from the Department of the Interior, but rather PRPs funds, state funds, local municipality funds, purveyor funds, the WQA assessment funds or non-profit funds. Funds from this program may be used for design, construction, and operation and maintenance for up to ten years following construction. The Restoration Fund for groundwater cleanup is administered via the USBR in conjunction with the WQA for use within the San Gabriel Basin.

Due to the emergency nature of the contamination and the threat it poses to the local groundwater supply, Congress allowed the use of past expenditures to be credited towards the 35 percent non-federal matching requirement under this program. The USBR is responsible for approving all qualifying prior expenditures. However, the WQA, at its discretion, will use this credit to meet the 35 percent matching requirement and eliminate the need to deposit additional funds into the Restoration Fund.

3.4. TITLE XVI

In 1992, Congress authorized the San Gabriel Basin Demonstration Project to implement conjunctive use projects in the Basin. By implementing cleanup projects that provide a reliable source of water and reduce the need for outside sources of water, many of the Basin's cleanup projects are eligible for this program.

This program requires a 75 percent match from non-federal sources. Funds from this program may be used for design and construction only. The Title XVI fund is administered via the USBR directly to the WQA for use within the Basin.

3.5. STATE GOVERNMENT

Proposition 13, introduced by Assembly Member Machado and Senator Costa on February 26, 1999, authorizes, pursuant to the State General Obligation Bond Law, bonds in the amount of \$1,970,000,000 for purposes of financing safe drinking water, water quality, flood protection, and water reliability programs. The WQA requested \$7 million in bond funds to be used with Federal and local funding sources to ensure that the necessary groundwater remediation facilities are constructed within the next two years and remain operational to restore and protect the drinking water supply of over 1 million San Gabriel Valley residents.

The WQA will focus on securing the \$30 million non-federal match through the recently passed Proposition 50, the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002. Also, the WQA will continue to work on having the Proposition 13 loan forgiven.

3.6. WATER QUALITY AUTHORITY

The WQA may impose an annual assessment for capital and operational costs not to exceed ten dollars per acre-foot. In the past, it has been the WQA's policy to utilize assessment dollars to 1) implement priority projects where no PRP or other funding is available; and/or 2) provide incentives for PRPs to provide funds in order to move forward on a given project. If PRPs do not voluntarily provide funds to a project, then the WQA will, on a project-by-project basis, consider the use of its assessment funds to underwrite the project costs with or without other local dollars. In these cases, the WQA's focus will be to first implement the project and later recover the costs from PRPs through negotiated settlements or litigation.

3.7. WATER PURVEYORS/CITIES/MEMBER AGENCIES/OTHER LOCAL WATER AGENCIES

As of January 2001, all potential projects requesting WQA participation must go through WQA's Procedure 38, "WQA Project Participation"(see Appendix C, Exhibit A). If PRP funds are not available, the WQA requires the impacted water purveyor to fund a minimum of 25 percent of capital costs. In the event projects cannot be otherwise fully funded using any or all of the above funding sources, the WQA will work with an affected city, member water agency and/or other local water agencies to develop potential funding sources. The WQA will pursue the recovery of these funds on behalf of the participating agency, if necessary.

4. LITIGATION

The WQA Act authorizes the WQA to bring legal action against responsible parties to recover the cost incurred in connection with remedial actions in the Basin.

The WQA may bring suit under CERCLA to any person or entity that owns or operates a facility from which there has been an actual or threatened release of a hazardous substance which has caused the WQA to incur response costs. That person or entity is liable for the costs of response. Liability similarly is imposed on persons and entities that previously owned or operated a facility at the time such hazardous substance(s) were released.

CERCLA further allows the WQA to seek to hold all PRPs jointly and severally liable for these response costs, recover prejudgment interest, and obtain a declaration from the court that the responsible parties are liable for future response costs. In addition, the WQA may seek to recover its attorney's fees incurred in bringing legal action (Appendix D – Litigation Strategies and Options, Tatro, Coffino, Zeavin, & Bloomgarden LLP, March 1, 2000).

5. COORDINATION WITH OTHER AGENCIES

The WQA was created to fulfill a need to coordinate response actions to the contamination in the Basin. The WQA calls for the involved federal, state, and local agencies to unite with all stakeholders to work more effectively and efficiently. Although there has been coordination between the WQA, the USEPA, the LARWQCB, and other regulatory agencies over the past 10 years with respect to groundwater cleanup, additional coordination and outreach efforts would be beneficial to all agencies involved. Since the WQA is a quasi-governmental agency, it needs to attain a higher level of transparency and accountability with respect to inter-agency cooperation/coordination. The WQA should notify the LARWQCB, with the following information prior to the approval of projects: (a) how projects are prioritized for funding; (b) what groundwater cleanup projects have been identified; (c) where has the WQA targeted its resources to address threatened drinking water supplies; (d) how contractors are selected; (e) what criteria are used to quantitatively evaluate projects for effectiveness; and (f) what factors played a critical role in reaching key project funding decisions.

To this end, more information is needed with respect to the rationale used for project prioritization, alternative solutions and cost-benefit analyses. Stakeholders who will benefit from this include, but are not limited to, the USEPA, USBR, the DTSC, the SWRCB, the LARWQCB, the DHS, the Main San Gabriel Basin Watermaster, cities affected by the Basin groundwater contamination, water purveyors in the Basin, and PRPs.

5.1. COORDINATION OF REMEDIAL STANDARDS

Section 102(b) of the WQA Act declares legislative intent directing the WQA to coordinate among state and federal government agencies to plan and implement groundwater cleanup. The Remedial Standards established by the WQA's Basinwide Groundwater Quality Management and Remediation Plan (as required by the WQA Sec. 106) incorporate rules, regulations and standards previously adopted by other agencies of the State of California. The Remedial Standards harmonize and coordinate the requirements of the Main San Gabriel Basin Watermaster, the SWRCB, the LARWQCB, and the DHS. One purpose of the Remedial Standards is to help integrate groundwater cleanup objectives with water supply objectives, according to the legislative intent directive set forth in Section 102(a) of the WQA Act.

The USEPA has recently recognized some of these Remedial Standards as ARARs. Federal Superfund Law requires parties responsible for pollution to comply with ARARs in the process of carrying out federal cleanup orders. ARARs include any state standard that is: (1) more stringent than any Federal requirement; (2) validly promulgated; and (3) either "applicable" or "relevant and appropriate" and has been identified by the state to the USEPA. Due in part to the efforts of the WQA, the USEPA's Unilateral Administrative Order (No.2003-17) for remedial design and remedial action in the SEMOU of the San Gabriel Valley Superfund Sites, issued on August 28, 2003: (1) encourages the parties identified as responsible for the pollution to integrate their cleanup obligations with water supply projects that exist or are under development; and (2) directs compliance with ARARs, such as meeting water quality standards for potable water service established by DHS and/or for discharge of the product water established by the LARWQCB.

6. PUBLIC INFORMATION

The public information program employs a variety of methods to reach everyone from specialized audiences, such as the local water community and legislators in Sacramento and Washington, to the general public in the San Gabriel Valley and beyond. This outreach effort is essential to gain public support and future funding.

6.1. WEB SITE

The WQA updates its web site (<http://www.wqa.com>) to provide instant access to public information, including news releases, publications, agendas, minutes of meetings and reports on projects. Providing information regarding inter-agency coordinated action responses in high priority areas is designed to inform the public and demonstrate how groundwater cleanup objectives are being fulfilled. Though the website provides

useful information, it does not provide status reports on how many wells are off production due to contamination, what actions WQA took to assist in rectifying the problem and what funds are being or have been expended to resolve the problem. With regard to the website, it does not have a search tool to assist users and most of the information contained within the website needs to be updated. The site news release sections and other portions addressing USEPA Superfund Areas are at least 1-½ years out of date. In addition, more reporting on the number of drinking water wells returned to active service would be useful. It would be helpful to have a technology sub-page to educate the website visitors on deployed groundwater technologies used to cleanup identified groundwater contaminants. In addition, the lawsuit against the PRPs in SEMOU is not mentioned. Finally, it would be useful to have WQA post on the website their groundwater cleanup performance reports to publicize their accomplishments.

6.2. MEETINGS WITH FEDERAL AND STATE LEGISLATORS

The WQA keeps the local offices of federal and state legislators informed of any developments and the progress of water cleanup issues in the Greater San Gabriel Basin. These efforts include office visits, tours of treatment facilities and invitations to participate in the WQA legislative committee. The WQA has begun to host a bi-monthly Legislative Water Forum Luncheon in which local legislators are invited to provide updates on state legislation as it pertains to the Basin water community. In addition, the WQA has developed an effective dialogue with federal legislators and has also organized several well-attended events featuring key lawmakers, such as U.S. Senator Dianne Feinstein, U.S. Senator Barbara Boxer, and Congressman David Dreier.

6.3. WRITTEN PUBLICATIONS

The WQA uses a variety of written publications to carry its message. These may include annual reports, brochures, bulletins for specific projects, and periodic news inserts in the *San Gabriel Valley Tribune*, *Pasadena Star News*, and the *Whittier Daily News* which are all published by the Los Angeles News Group. The WQA works with major news outlets, such as the *Los Angeles Times*, and foreign language publications, such as *La Opinion* and the *Chinese Daily News*. The WQA provides information to other local newspapers, city and chambers of commerce newsletters, publications directed at water and environmental interests.

6.4. PUBLIC MEETINGS AND WORKSHOPS

The WQA Board, through public meetings and workshops, interacts with the public to provide information and to solicit input. In addition, the WQA works with other agencies on information projects and participates with other agencies on public outreach efforts.

6.5. OTHERS

All projects involving the WQA follow an established process, including all applicable federal, state and local regulations. Because the San Gabriel Valley is a Superfund site, the process always includes meeting requirements under the National Contingency Plan, including its public participation component, in order to ensure maximum cost recovery potential. In addition, the WQA works closely with water purveyors to help them meet the extensive public outreach requirements set forth in the DHS, Technical Memorandum 97-005.

7. REMEDIATION PROJECTS

7.1. BALDWIN PARK OPERABLE UNIT

Of the five areas of contamination in the Basin, the BPOU is considered the most significant because of the geographic size and degree of contamination (Figure 2 – Baldwin Park Operable Unit). By 1994 under USEPA, a general consensus had been obtained on the technical approach including a financial arrangement whereby sales from the water produced by the treatment plant would be used to offset the costs of the project. However, just as the designs were being prepared, the discovery of new contaminants prompted a complete reevaluation of cleanup plans.

In response to the spreading contamination and loss of local water supply, the WQA with the assistance of the State of California and local water districts constructed two VOC treatment facilities. The first treatment facility was the *Arrow/Lante Treatment Facility* with a capacity of 3,000 gallons per minute (gpm) constructed in 1992 utilizing air-stripping technology with off-gas vapor-phase carbon treatment. A summary of the project cost and funding source is presented in Table 2 – Project Cost and Funding Source. The second treatment facility was the *Big Dalton Treatment Facility* with a capacity of 3,000 gpm constructed in 1995 utilizing liquid-phase granular activated carbon. Both treatment facilities operated until the discovery of emergent chemicals in the BPOU.

In 1997, perchlorate, a contaminant derived from solid rocket fuel, was discovered in many of the active production wells within the operable unit and forced the shut down of the *Arrow/Lante* and *Big Dalton Treatment* facilities. This discovery had widespread impact, primarily because traditional treatment methods were ineffective in removing perchlorate from the groundwater. The new discovery not only disrupted the design of the CERCLA remedy, but also shut down many of the existing treatment plants that had been operating for water supply purposes. In one case, a water purveyor's (La Puente Valley County Water District [LPVCWD]) complete water supply was shut down due to excessive concentrations of perchlorate that could not be removed by currently installed treatment facilities. This forced the water purveyor to buy imported water at about five times the cost of water production before the discovery of perchlorate.

Based on the discovery of perchlorate, USEPA updated its Record of Decision (ROD) and issued a plan update (Appendix E – San Gabriel Valley Superfund Sites / Baldwin Park Operable Unit, USEPA, Region 9, May 1999). This update was similar to the original ROD except that the containment requirement in the southern portion of the operable unit was shifted further downgradient to address the new contaminants and the larger VOC plume. The USEPA plan requires that about 22,000 gpm of contaminated groundwater be extracted and treated.

In 1998, USEPA accepted a good faith offer from a portion of the BPOU PRPs to extract water from specified locations, treat the water at centralized facilities, and then discharge the water into nearby surface water channels. USEPA's approach focused on overall containment of the plume.

The WQA prescribes a cleanup plan developed by the Main San Gabriel Basin Watermaster (Figure 2) that will integrate cleanup and water supply objectives. In 1999, the WQA, Watermaster, and Upper San Gabriel Valley Municipal Water District joined resources and began implementation of the plan by constructing the first facility to treat both perchlorate and NDMA for drinking water at the LPVCWD well site at a capacity of 2,500 gpm. Additional early actions were prescribed by the WQA that build on the *LPVCWD Project* development model.

Southern Remedy

A new 7,800 gpm treatment facility located at the *San Gabriel Valley Water Company (SGVWC) B6 Plant* near the southern extension of the plume is prescribed for immediate implementation (Figure 2). The project also includes the construction of four new extraction wells (SA3-1A, SA3-1B, SA3-2A, and SA3-2B) and transmission pipelines connecting the extraction wells to the *SGVWC B6 Plant* treatment facility. The project will halt the flow of contamination and protect downgradient water supply sources currently active in the BPOU area.

The next component of the remedy prescribed for the southern area is a new 7,800 gpm treatment facility that will be located at the *SGVWC B5 Plant*. The *SGVWC B5 Plant* treatment facility will process water from a new well (B5B) on site and from the existing City of Industry Well No. 4 (or a new replacement well) to the south. The project will allow these purveyors to meet their respective water supply demand and will serve as a final containment point. To date, this project is in its initial design phase and is expected to be completed by the end of 2004. The project is estimated to cost \$20 million of which the WQA will provide more than \$5 million (Table 2).

Northern Remedy

The plan prescribes a new 7,800 gpm treatment facility at the Valley County Water District (VCWD) Arrow/Lante wellfield (Figure 2). New extraction wells (SA1-1 and SA1-2) will be constructed east of the treatment facility. Information on the cost of the *VCWD Arrow/Lante SA1* treatment facility is included in Table 2. The plan also

includes a treated water pipeline to deliver some of the treated water to the Suburban Water Systems (SWS).

Implementation of the northern remedy will provide significant removal of mass from the Basin and is a necessary component of the overall BPOU plan. However, with the exception of the Arrow/Lante wellfield, the northern remedy provides only ancillary benefits towards preventing migration of contamination towards critical water supplies. This project is in its final construction phase and will be completed by early 2004. Of the estimated \$36 million construction cost, the WQA will fund up to approximately \$9 million (Table 2).

Other Remedies

California Domestic Water Company's (CDWC) well No. 14 (Figure 2) is threatened by contamination emanating from the BPOU, including perchlorate and NDMA. CDWC expanded its existing 5,000 gpm VOC and NDMA treatment systems by including an additional 5,000 gpm treatment system to remove perchlorate. The *CDWC Well 14* treatment facility is also designed to protect CDWC's downgradient wells. Construction was completed in June of 2002. Table 2 summarizes the cost of the project.

After losing its Plant 139 wellfield to the BPOU contamination, SWS constructed as an interim project a new *Production Well and Pipeline at Plant 121 and Plant 142* for a combined capacity of 6,000 gpm. The pipeline will allow better operational flexibility and provide additional supply to its affected service area.

In 2002, eight of the twenty PRPs of BPOU entered into a comprehensive project agreement with the WQA, Watermaster, and local purveyors to fund the prescribed remedy.

7.2. SOUTH EL MONTE OPERABLE UNIT

The SEMOU is generally characterized by shallow groundwater contamination that is mostly contained in the upper 100 feet of the aquifer (Figure 3 – South El Monte Operable Unit). However, some contamination in the northwest and southern portions of the operable unit has migrated below 100 feet into the intermediate zone aquifers currently used for potable supplies. Contamination in the SEMOU is predominantly VOCs with perchlorate in certain areas. Furthermore, the presence of low concentrations of 1,4-dioxane in the southern portion of the operable unit has complicated cleanup.

The contamination in the SEMOU presents significant threats to local water supplies (Figure 3). One threat is to the aquifers and groundwater supply centers to the northwest of the operable unit and the other is directed towards the Whittier Narrows Dam and the Central Basin to the south. The threat to the northwest has already impacted several critical water supply wells, primarily those owned by the City of Monterey Park (MP), SGVWC, and Southern California Water Company (SCWC).

Continued migration of the contamination past the Whittier Narrows Dam threatens many production wells and the sensitive recharge areas within the Central Basin.

USEPA released its Interim ROD (Appendix F – San Gabriel Valley Superfund Site South El Monte Operable Unit, Proposed Plan, USEPA, Region 9, September 1999) in September 2000 to address the VOC groundwater contamination in the SEMOU (Figure 3). The ROD specifies extraction from the intermediate zone at or near MP's well No. 5, MP's existing well No. 12, and SGVWC's existing wellfield No. 8, and SCWC's existing San Gabriel (SG1 and SG2) wellfield. USEPA's plan also includes a new extraction well (MP No. 15) northeast of MP No. 12. USEPA's goal is to contain the flow of contaminants and prevent exposure to downgradient pumping centers operated by MP, SGVWC, and other purveyors. After the discovery of perchlorate in several SEMOU wells, USEPA is considering issuing a ROD Amendment to include treatment for the emergent chemicals, perchlorate and 1,4-dioxane.

Northwest Intermediate Aquifer

To address the threat presented in the northwest portion of the operable unit (Figure 3), the WQA's prescribed action includes the existing 2,500 gpm VOC treatment facility at *MP Well No. 5*, the newly constructed 4,500 gpm VOC and perchlorate treatment facility at *MP Well No. 12*, the 5,000 gpm *SGVWC Plant 8*, and the 2,100 gpm *SCWC SG1 and SG2* facility. Additionally, the plan specifies the construction of a new pipeline that connects the proposed *MP Well No. 15* with the existing treatment facility at *MP Well No. 12*. Table 2 summarizes the cost and funding source of these projects and other projects within the SEMOU.

This plan promotes the beneficial use of the treated water by the appropriate water purveyors. To that end, the WQA entered into funding contracts in the year 2000 with MP, SCWC, and SGVWC to construct VOC treatment projects ahead of enforcement action by USEPA.

SGVWC Plant 8 VOC treatment facility was completed in October 2000 and is currently operating. Both VOC treatment facilities *MP Well No. 12* and *SCWC SG1 and SG2* were completed in early 2002. However, the wells for both plants were contaminated with perchlorate and immediately shut down. As a result, both purveyors are evaluating construction of perchlorate treatment facilities for those wells.

The construction of *MP Well No. 15* and the associated pipeline to *MP Well No. 12* will be completed in 2003. Additionally, the City of Monterey Park has proposed to connect existing *MP Well No. 6* to the existing VOC treatment facility at *MP Well No. 5*. The treatment facility has enough capacity to treat both Well No. 5 and Well No. 6. The City of Monterey Park has also proposed to construct a 4,500 gpm VOC treatment facility at its Delta Plant to treat VOC contamination that was recently discovered in *MP Well No. 1, 3, and 10*. The project is consistent with USEPA's ROD.

SGVWC is moving forward with its plans to construct a 1,200 gpm VOC treatment facility at its Plant G4 located within the SEMOU. The *SGVWC Plant G4* project is

also consistent with USEPA's ROD.

These actions will accelerate removal of contaminant mass and help to prevent migration of contamination into critical water supplies. In addition, integrating the cleanup action with the surrounding water supply will mitigate the current water supply crisis caused by the presence of the contamination.

South El Monte Extraction Barrier

Part of the WQA's prescribed remedy to address the threat to Central Basin is the South El Monte Shallow Extraction Barrier (*South El Monte Barrier*) (Figure 3). The 1,000 gpm *South El Monte Barrier* was constructed under a voluntary partnership including the WQA, several local businesses, and the City of South El Monte. The objective of the remedial action is to halt the flow of contaminants near the primary source areas within the SEMOU. The project consists of two extraction wells, treatment facilities, and discharge pipes, which allow the treated water to infiltrate back into the aquifer downgradient of the extraction. The project was originally constructed to remove VOCs and later modified with ozone/peroxide treatment to remove 1,4-dioxane. Table 2 provides information about the project cost.

7.3. EL MONTE OPERABLE UNIT

The El Monte Operable Unit (EMOU) investigation phase has been completed and the remedial objectives have been specified in the USEPA ROD. This operable unit is generally characterized by shallow groundwater VOC contamination that is mostly contained in the upper 100 feet of the aquifer (Figure 4 – El Monte Operable Unit).

The predominantly shallow VOC groundwater contamination simplifies the cleanup approach. However, a significant threat to the deeper drinking water supplies exists. Fortunately, several of the water purveyors have already responded to the spread of contamination by installing wellhead treatment facilities to restore impaired sources of supply. However, the City of El Monte lost several wells and experienced a shortage of supply. In 1999, the WQA assisted the City of El Monte by providing two surplus granular activated carbon (GAC) vessels from its Arrow Well project for the City's wellhead treatment facility. In addition, in 2002, the WQA provided the City with two additional surplus GAC vessels from its Whittier Narrows Barrier project to allow the City to further restore its lost supply.

In response to contamination in the EMOU, USEPA released its Interim ROD (Appendix G – San Gabriel Valley Groundwater Contamination Superfund Site / El Monte Operable Unit, Proposed Plan, USEPA, Region 9, October 1998) in June 1999, which requires containment and treatment of the shallow plume on the western and eastern sides of the operable unit with estimated extraction rates of 120 gpm and 180 gpm respectively, and containment of the intermediate plume on the northwestern and southern edges of the operable unit. In 2002, USEPA released an Explanation of Significant Differences that requires the containment of emerging chemicals in addition to VOCs. The existing 2,250 gpm *SCWC Encinita Plant* treatment facilities owned and

operated by SCWC and a new 800 gpm *Adams Ranch Mutual Water Company (ARMWC) West Deep Plant* will address the deep plume in the northwestern sector (Figure 4). The *West Deep Plant* will be owned and operated by ARMWC and will treat VOCs. Pursuant to the ROD, the Northwest El Monte Community Task Force (Task Force) in conjunction with California American Water Company (CAWC) will implement the *CAWC East Deep Extraction* treatment facility. This project includes the installation of one or two extraction wells in the intermediate zone in the southeastern sector with a total capacity of approximately 1,000 gpm to control migration of low levels of VOCs. The treated water will be conveyed into CAWC's existing distribution system in the area.

The WQA's prescribed remedy for the EMOU addresses the need to accelerate cleanup in the shallow aquifer and the need to integrate cleanup with water supply. With respect to the shallow aquifer, the WQA is prescribing the immediate implementation of two shallow extraction barriers to accelerate the removal of mass and stop the flow of contamination on the western and eastern portion of the operable unit (Figure 4). Anticipating that this type of removal would be required, the WQA and many of the PRPs for the EMOU have executed agreements that will fund the construction of these projects. As part of this early response, the WQA sponsored three projects (extraction and treatment at the *Clayton Manufacturing* facility and individual extractions with centralized treatment at the *Hermetic Seal*, and *Crown City Plating* facilities) which are already in place and operational. Table 2 summarizes the cost of these projects.

Because the water extracted from the shallow aquifer is not desirable for use (high TDS and Nitrates), local water purveyors are not interested in integrating the treated water into the local supply. Thus, the water obtained from the shallow extraction barriers should be put to beneficial use for industrial applications.

The WQA's prescribed remedies for the intermediate aquifers include SCWC's Encinita Plant extraction and treatment facility, ARMWC's extraction well and treatment facility and CAWC's extraction wells and treatment facility (Figure 4). Together, all of these facilities will serve to contain the migration of the contamination in the intermediate (potable) aquifers and prevent the further spread of contamination into critical groundwater supplies. The WQA also prescribes that treated water from all these facilities be beneficially used in the respective potable water supplies. The WQA is currently working with SCWC, ARMWC, CAWC, and the PRPs to provide federal reimbursement funds for their respective facilities.

7.4. WHITTIER NARROWS OPERABLE UNIT

In 1999, USEPA issued an amendment to the ROD for the Whittier Narrows Operable Unit (WNOU) which identifies the need for a groundwater extraction barrier approximately ¼ mile north of the Whittier Narrows Dam (Appendix H – San Gabriel Valley Superfund Site: Whittier Narrows Operable Unit, Proposed Plan, USEPA, Region 9, October 1998) to halt the flow of contamination traveling towards Central Basin (Figure 5 – Whittier Narrows Operable Unit). To form an effective barrier, five

or six extraction sites were required to remove and treat a total of 12,000 gpm. USEPA was implementing this remedy under its “fund lead” authority, the responsibility for administering the design, construction, and operation of the comprehensive cleanup facility was USEPA. Table 2 summarizes the WQA’s cost associated with this project. Recently, USEPA entered into an agreement with the City of Whittier to integrate a portion of the treated water into its delivery system.

In 2000, the WQA in conjunction with certain SEMOU PRPs constructed the *WNOU Early Action Barrier* as an interim remedial measure in the period of time before USEPA finished construction on the comprehensive WNOU project. By extracting shallow zone groundwater containing high concentrations of VOCs, the Early Action Barrier aims to inhibit VOC migration toward Central Basin and remove VOC mass from the shallow zone aquifer. The system extracts groundwater from existing well EW4-3 and is routed through a 1,500 gpm liquid phase granular activated carbon treatment facility.

In recognition of the immediate threat to downgradient water supplies in Central Basin, the WQA proposed that well EW4-3 (Figure 5) be integrated in the comprehensive potable treatment facility proposed by USEPA. The WQA implemented the construction of a temporary treatment facility located at well EW4-3. In 2002, USEPA completed construction of its centralized treatment facility and integrated well EW4-3 into its extraction system.

7.5. PUENTE VALLEY OPERABLE UNIT

In 1998, the USEPA released in Interim Record of Decision (ROD) for the PVOU (Figure 6 – Puente Valley Operable Unit) that described, in part, USEPA’s selected remedy for both shallow and intermediate zone contamination (Appendix I –San Gabriel Valley Superfund Site / Puente Valley Operable Unit, Proposed Plan, USEPA, Region 9, January 1998). It stated that the remedial action for the shallow zone shall prevent contaminated groundwater from migrating beyond its current lateral and vertical extent as described in the Remedial Investigation/Feasibility Study (RI/FS). The remedial action selected by USEPA for the intermediate zone shall prevent contaminated groundwater from migrating beyond the B7 Well Field Area and the contaminated area downgradient of those wells. Furthermore, perchlorate was recently discovered in the B7 Well Field area causing USEPA to further evaluate remedy options.

USEPA will be implementing the *USEPA Shallow Zone Remedy* under its “fund lead” authority in 2005. The shallow zone remedy will consist of the installation of extraction wells at the mouth of the valley and treatment for VOCs at a capacity of 1,300 gpm. Since water from the shallow zone is not suitable for potable use, the treated water may be conveyed in the City of Industry’s reclaimed water system or discharged to neighboring creeks. It is expected that USEPA will recoup all of its expenses for implementation of the shallow zone remedy from recalcitrant PRPs in the PVOU.

The PVOU Steering Committee (PVOUSC) lead by Northrop Grumman (formerly TRW) has submitted the *PVOUSC Intermediate Zone Plan* to USEPA for approval. The PVOUSC plans to construct several new extraction wells and an estimated 1,500-gpm VOC treatment facility. The PVOUSC is currently negotiating with local purveyors to put the water to beneficial use. The WQA continues to facilitate discussions between parties to address the intermediate zone remedy and the affected water supply in this area. Table 2 shows the estimated cost of the project.

The San Gabriel Valley Company (SGVWC) has proposed two separate treatment projects within the PVOU, the *SGVWC Plant B11* and the *SGVWC Plant B24* treatment facilities (Figure 6). The B11 project would utilize a new replacement well, and an existing well with VOC treatment at an estimated capacity of 2,500 gpm, SGVWC also proposes to drill two new water production wells at the new B24 treatment facility (located east of the B7 treatment facility) to treat VOC contamination at an estimated capacity of 5,000 gpm. The WQA has reserved funds to offset the cost of these cleanup projects and to provide an incentive to expedite their construction. Table 2 summarizes the estimated cost of these projects. However, PRPs and USEPA are analyzing new data from modeling results to identify the most effective extraction location(s) for containment and removal efforts.

7.6. ALHAMBRA OPERABLE UNIT

In 1999, USEPA began RI/FS investigations in the Alhambra Operable Unit. The purpose of the RI/FS is to determine the nature and extent of soil and groundwater contamination and to identify likely sources (Appendix J). Future work includes the installation of additional monitoring wells in order to collect additional data to assess the extent of the contamination and its relationship to suspected source areas.

VOC contamination in the area impacted the City of Alhambra's Well No. 7 (Figure 7 – Alhambra Operable Unit), as a result, the City decided to construct the *City of Alhambra Phase I Pump and Treat Program*. Phase I consists of a 1,600 gpm treatment facility at Well No. 7. Additionally, the City is in the process of designing the *City of Alhambra Phase II Pump and Treat Program*. Phase II will consist of a 5,400 gpm treatment facility to address contamination affecting Wells No. 8, 11, and 12. The WQA supports the construction of these VOC treatment facilities and has reimbursed the City of Alhambra for a portion of its Phase I treatment facility and allocated funding for the construction of Phase II treatment facility for Wells No. 8, 11, and 12.

While this OU has been on the USEPA's list, it was not a priority until this past year. The WQA has also prioritized this area due to the increasing level of contaminants and has reserved funds to assist the City of Alhambra. Because the USEPA has only recently begun its process in this OU, no PRPs have yet been identified to fund the cleanup.

7.7. NON-OPERABLE UNIT PROJECTS

The necessity for cleanup in the Basin is not limited to the specific locations designated by USEPA's OUs. USEPA's RODs do not address remedial actions necessary to restore water supply wells in areas that are outside of USEPA's OU geographical boundaries. Many contaminated water supply wells are facing imminent shutdown or have already been shut down and remain in this state largely due to overburdened regulatory agencies. The WQA prescribes the treatment of the water at these wells to restore the water supplies and to remove contaminant mass from the Basin.

One of these remedial actions is in the City of Monrovia (Monrovia). Monrovia is located in the northern portion of the Basin, west of the large BPOU contamination plume. In 1994, the WQA, State of California, and Monrovia entered into a joint agreement to construct the *Monrovia Treatment Facility* with capacity of 5,400 gpm. The treatment facility removed VOCs from three of Monrovia's water supply wells using air-stripping technology. Recently, Monrovia is experiencing increased contamination in its water supply wells due to the ever growing contamination plume. To combat the increased contamination, the WQA has allocated the use of federal funds to assist Monrovia in the construction of an additional 6,000 gpm VOCs treatment facility (*City of Monrovia GAC Treatment Facility*).

Another of these remedial actions is the allocation of federal funds to assist Amarillo Mutual Water Company (AMWC) in the construction of a VOCs treatment facility (*AMWC Treatment Facility*). AMWC is a small water purveyor in the Basin outside of the SEMOU.

8. CONCLUSIONS

- a) The completion of WQA-funded treatment facilities has helped maintain the drinking water supply for the Basin communities. The treatment facilities have also contributed to the overall cleanup effort (mass removal) of groundwater contaminants. The pump and treat remedial efforts have helped to control migration of contaminants throughout the Basin and into the Central Basin. The WQA has been instrumental since its inception in expediting the funding of treatment facilities and implementing groundwater cleanup in the Basin, specifically, in Baldwin Park, South El Monte, El Monte, and Whittier Narrows OUs. These efforts require a considerable amount of coordination with Federal, State, and local regulatory agencies. However, this coordination and inclusion of other regulatory agencies in the project prioritization decision-making process needs to be improved.
- b) The efforts of WQA must be acknowledged for funding much needed groundwater remediation infrastructure projects to provide drinking water and restore the basin's beneficial uses for groundwater. The focus should now shift to maximizing contaminant mass removal. Based on information provided by the WQA (Table 1), the WQA has spent about \$98.7 million (capital costs, operation and maintenance {O&M}) to remove

26,000 pounds of volatile organic compounds (VOCs) from the impacted aquifers in the Basin between 1992 and 2003. Though these costs will be amortized over many years, O&M costs may increase in the long-term due to the higher costs associated with the remedial technologies used and the uniqueness of the emergent chemicals (perchlorate 1,4 dioxane, and NDMA) involved.

9. RECOMMENDATIONS

- a) Although there has been coordination between the WQA, the USEPA, the LARWQCB, and other regulatory agencies over the past 10 years with respect to groundwater cleanup, additional coordination and outreach efforts would be beneficial for all agencies involved. As a quasi-governmental agency, the WQA needs to attain a higher level of transparency and accountability with respect to inter-agency cooperation/coordination. The WQA should document how projects are prioritized and selected for funding and how contractors are selected. The WQA should also identify criteria used to quantitatively evaluate projects for effectiveness. The WQA should increase coordination with USEPA which has the ultimate authority to approve projects that address both water supply and Superfund groundwater cleanups, since the Basin is a Superfund site.
- b) Improvements with respect to increased periodic reporting will be helpful to all stakeholders involved in groundwater cleanup efforts in the Basin. To achieve these improvements, the WQA needs to provide more frequent reporting (quarterly or semi-annually) to USEPA, the SWRCB and the LARWQCB. These regulatory agencies will benefit from: (1) receiving periodic update and performance reports that specify the location and details of cleanup projects funded; (2) a status report on groundwater quality; (3) the results of the WQA's coordinated groundwater cleanup efforts; and (4) the quantity of groundwater contaminants removed
- c) The WQA should invest the time and effort to update their website, since this is an important source of information for all stakeholders with an interest in groundwater cleanup issues in the San Gabriel Valley.

TABLES

TABLE 1
MAJOR ACTIVITIES AND MILESTONES

MONTH	YEAR	AREA ⁽¹⁾	ACTIVITY / MILESTONE	VOCs REMOVED
				(lbs)
Jan.	1992	BPOU	Arrow Well Treatment facility completed	17,425
Sep.	1992		SB 1679 approved authorizing WQA	
Aug.	1994	BPOU	WQA develops Consensus plan integrating water supply and clean	
Feb.	1995	MONROVIA	Monrovia treatment facility completed	93
Feb.	1995	EMOU	WQA and PRPs form partnership to conduct voluntary investigations and remedy design study	
Apr.	1995	BPOU	WQA and PRPs form partnership for voluntary pre-design leading to \$4.39M in contributions from PRPs	
May	1995	BPOU	Construction completed for Big Dalton treatment facility	83
Nov.	1995	SEMOU	WQA and PRPs form partnership to conduct voluntary investigations and remedy design study	
Feb.	1996	BPOU	State and Federal Environmental Documentation Completed for BPOU cleanup	
Feb.	1996	BPOU	Final design and construction administration transferred to 3 Valleys MWD	
Jun.	1996	BPOU	Perchlorate discovered	
Nov.	1996	EMOU	Crown City Plating/Hermetic Seal treatment facility construction completed	1000
Feb.	1997	EMOU	WQA assists City of El Monte with GAC Carbon Vessels	201
Sep.	1997	BPOU	WQA successfully acquires \$1.7M from state administered escrow funds and reimburses BPOU producer for cleanup costs	
Jul.	1998	EMOU	WQA sponsored investigation and design study completed	
Jul.	1998	EMOU	WQA and PRPs form partnership to conduct voluntary design and implementation of early action cleanup	
Mar.	1998	EMOU	Clayton Manufacturing treatment facility construction completed	300
Oct.	1998	BPOU	WQA first to authorize \$1.5M to expedite LPVCWD Treatment facility construction and acquires 25% USBR matching funding	

TABLE 1
MAJOR ACTIVITIES AND MILESTONES

MONTH	YEAR	AREA ⁽¹⁾	ACTIVITY / MILESTONE	VOCs REMOVED
				(lbs)
Jan.	1999		Initiated legislation (H.R. 910) with Water Association to acquire \$75M in federal funding to accelerate cleanup	
Apr.	1999	SEMOU	WQA sponsored investigation and design study completed	
Jul.	1999	SEMOU	Shallow Barrier early action completed to halt migration from sources into Whittier narrows	1,482
Sep.	1999	SEMOU	City of Monterey Park Well 5 Treatment Facility Construction Completed	156
Jan.	2000	WNOU	Early action barrier completed to arrest flow into Whittier Narrows	1,370
Feb.	2000	BPOU	LPVCWD treatment plant construction complete and undergoing DHS testing	2,853
Dec.	2000	BPOU	CDWC Well 14 Treatment Facility construction completed	1,420
Jan.	2001	EMOU	Construction completed for SCWC Encinita treatment facility	167
Nov.	2001	SEMOU	Construction completed for SCWC SG1 and SG2 treatment facility	18
May	2002	BPOU	WQA becomes signatory to the comprehensive BPOU Project Agreement	
July	2002	SEMOU	WQA and local purveyors reach settlement agreement with thirteen SEMOU PRPs	
Aug.	2002	SEMOU	Construction completed for SGVWC Plant 8 treatment facility	106
TOTAL VOCs REMOVED ⁽²⁾				26,674

NOTES:

1- BPOU: Baldwin Park operable Unit

EMOU: El Monte Operable Unit

SEMOU: South El Monte Operable Unit

WNOU: Whittier Narrows Operable Unit

2- Pounds removed as of June 30, 2003

TABLE 2
PROJECT COST AND FUNDING SOURCE

OPERABLE UNIT / PROJECT NAME	CAPITAL COSTS INCURRED	ESTIMATED CAPITAL COSTS	TOTAL CAPITAL COSTS	ESTIMATED ANNUAL	FUNDING SOURCES - CAPITAL COSTS					
	TO DATE ¹	TO COMPLETE		O&M COSTS	WQA ASSESSMENT	WQA FEDERAL FUNDING	STATE FUNDING	RESPONSIBLE PARTIES	WATER PRODUCERS	TOTAL
<u>BALDWIN PARK</u>										
Arrow/Lante Treatment Facility (3)	1,378,671	0	1,378,671	0	83,671	0	1,295,000	0	0	1,378,671
Big Dalton Treatment Facility (3)	3,392,654	0	3,392,654	0	1,638,996	0	1,753,658	0	0	3,392,654
LPVCWD Project	7,495,910	1,373,000	8,868,910	900,000	0	2,203,655	0	6,665,255	0	8,868,910
SGVWC B6 Plant (2)	18,087,125	10,612,875	28,700,000	2,500,000	0	8,636,000	0	20,064,000	0	28,700,000
SGVWC B5 Plant (2)	357,326	15,754,674	16,112,000	2,500,000	0	4,259,100	0	11,852,900	0	16,112,000
VCWD Arrow/Lante SA1(2)	25,814,685	10,608,315	36,423,000	2,200,000	0	9,500,000	0	26,923,000	0	36,423,000
California Domestic Well 14	5,957,761	342,239	6,300,000	2,000,000	0	2,575,000	0	3,725,000	0	6,300,000
SWS Production Well and Pipeline (Plant 121 & 142)	5,727,982	0	5,727,982	800,000	0	887,500	0	4,840,482	0	5,727,982
<u>SOUTH EL MONTE</u>										
MP Well No.5	733,000	6,000,000	6,733,000	900,000	0	366,500	0	366,500	6,000,000	6,733,000
MP Well No.12 (VOC, Perchlorate, GAC) (2)	4,532,941	653,530	5,186,471	2,149,149	568,235	3,118,236	0	0	1,500,000	5,186,471
SGVWC Plant 8 (VOC, GAC)	1,361,903	2,578,612	3,940,515	348,000	634,758	1,655,257	0	80,000	1,570,500	3,940,515
SCWC SG1 & SG2 (VOC, Perchlorate) (2)	997,989	294,390	1,292,379	319,311	498,995	653,994	0	0	139,390	1,292,379
MP Well No.15 and Pipeline (2)	271,557	928,443	1,200,000	0	600,000	300,000	0	300,000	0	1,200,000
MP Well No. 6 Pipeline (4)	0	240,000	240,000	0	0	120,000	0	120,000	0	240,000
MP Well No. 1,3,10 (2)	0	1,100,000	1,100,000	100,000	0	550,000	0	0	550,000	1,100,000
SGVWC Plant G4 (4)	0	1,650,000	1,650,000	100,000	200,000	600,000	0	850,000	0	1,650,000
South El Monte Barrier	1,400,361	0	1,400,361	200,000	1,153,484	137,377	0	109,500	0	1,400,361
<u>EL MONTE</u>										
Crown City Plating/Hermetic Seal Treatment Facility	207,078	0	207,078	(6)	68,724	0	0	138,355	0	207,079
Clayton Manufacturing Treatment Faciltiy	453,792	0	453,792	(6)	77,841	0	0	375,951	0	453,792
West Shallow Extraction (4)	0	1,866,715	1,866,715	454,021	600,000	466,679	0	800,036	0	1,866,715
East Shallow Extraction (4)	1,000,000	4,386,000	5,386,000	488,080	0	1,346,500	0	4,039,500	0	5,386,000
SCWC Encinita Plant	887,649	3,000,000	3,887,649	184,450	0	2,021,126	0	1,866,523	0	3,887,649
ARMWC West Deep Plant	340,030	0	340,030	19,500	0	117,000	0	223,030	0	340,030
CAWC East Deep Extraction (4)	0	3,774,000	3,774,000	476,000	0	1,719,404	0	2,054,596	0	3,774,000
<u>WHITTIER NARROWS</u>										

TABLE 2
PROJECT COST AND FUNDING SOURCE

OPERABLE UNIT / PROJECT NAME	CAPITAL COSTS INCURRED	ESTIMATED CAPITAL COSTS	TOTAL CAPITAL COSTS	ESTIMATED ANNUAL	FUNDING SOURCES - CAPITAL COSTS					
	TO DATE ¹	TO COMPLETE		O&M COSTS	WQA ASSESSMENT	WQA FEDERAL FUNDING	STATE FUNDING	RESPONSIBLE PARTIES	WATER PRODUCERS	TOTAL
USEPA Fund-Lead Remedy (5)	0	0	0	0	0	0	0	0	0	0
WQA Early Action Barrier (3)	428,217	0	428,217	620,000	428,217					428,217
<u>PUENTE VALLEY</u>										
USEPA Shallow Zone Remedy (5)	0	0	0	0	0	0	0	0	0	0
PVOUSC Intermediate Zone Plan (4)	0	7,820,126	7,820,126	1,692,025	0	1,555,032	0	0	6,265,094	7,820,126
SGVWC Plant B11 (4)	0	2,500,000	2,500,000	1,200,000	0	925,000	0	0	1,575,000	2,500,000
SGVWC Plant B24 (4)	0	1,500,000	1,500,000	200,000	0	475,000	0	0	1,025,000	1,500,000
<u>ALHAMBRA</u>										
City of Alhambra Phase I Pump and Treat Program	0	787,205	787,205	400,000	0	400,000	0		387,205	787,205
City of Alhambra Phase II Pump and Treat Program (4)	0	3,540,000	3,540,000	450,000	0	1,010,000	0		2,530,000	3,540,000
<u>CITY OF MONROVIA</u>										
Monrovia Treatment Facility	1,399,652	0	1,399,652	0	715,153		684,499			1,399,652
City of Monrovia GAC Treatment Facility (4)	0	1,000,000	1,000,000	0	0	506,211	0		493,789	1,000,000
<u>AMARILLO MUTUAL WATER CO.</u>										
AMWC Treatment Facility (4)	0	1,000,000	1,000,000	(6)	0	506,211	0		493,789	1,000,000
TOTAL COSTS	77,454,958	83,310,130	160,765,088	21,200,536	5,545,407	46,610,782	684,499	85,394,628	22,529,767	160,765,083

Notes:
(1) Activity through 12/03
(2) Construction Underway
(3) Treatment Facility Shut Down
(4) Contruction Not Started
(5) EPA Fund-Lead No Data Available
(6) No Data Available

FIGURES

San Gabriel Basin Contamination

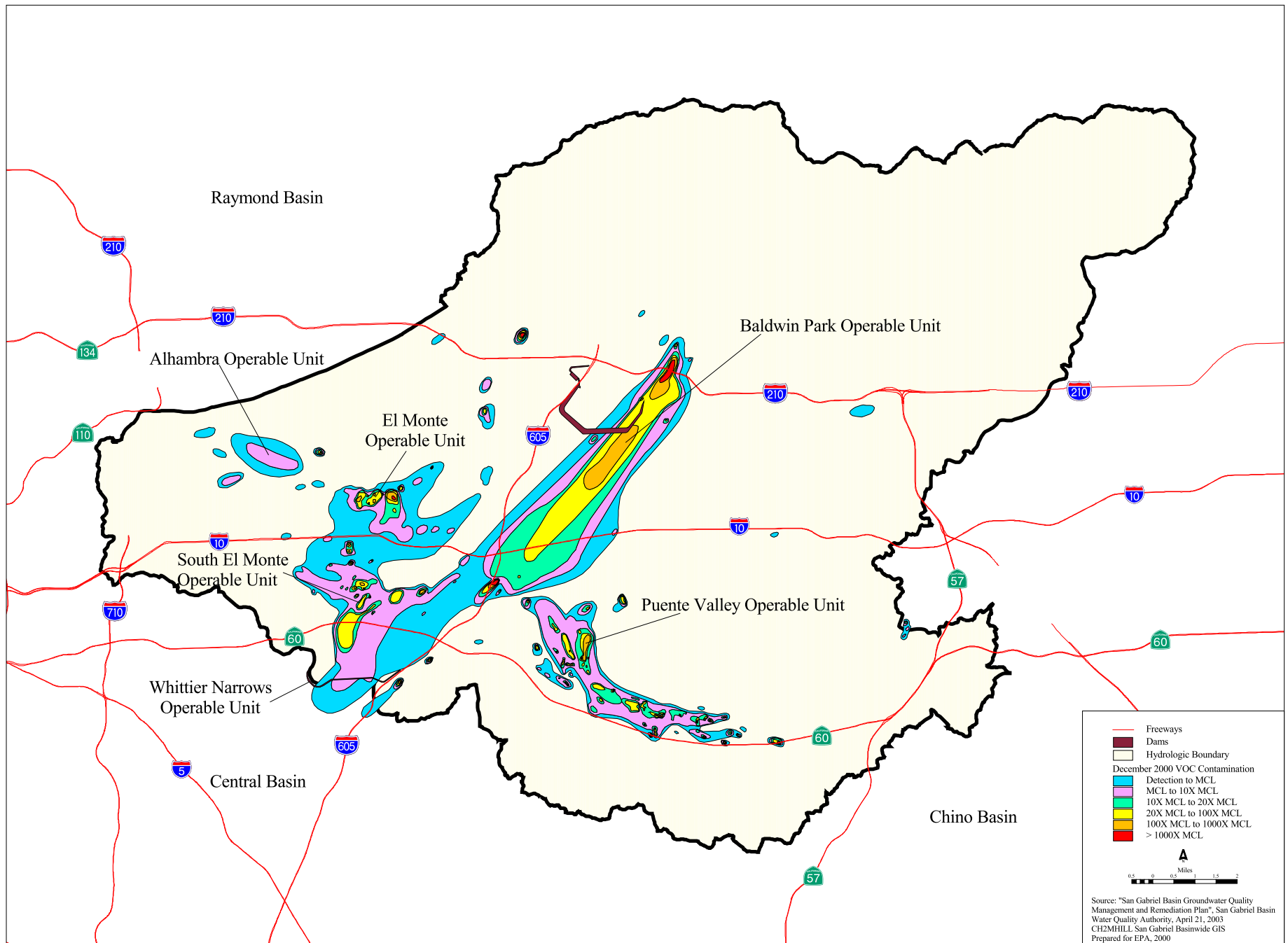


Figure 1

Baldwin Park Operable Unit

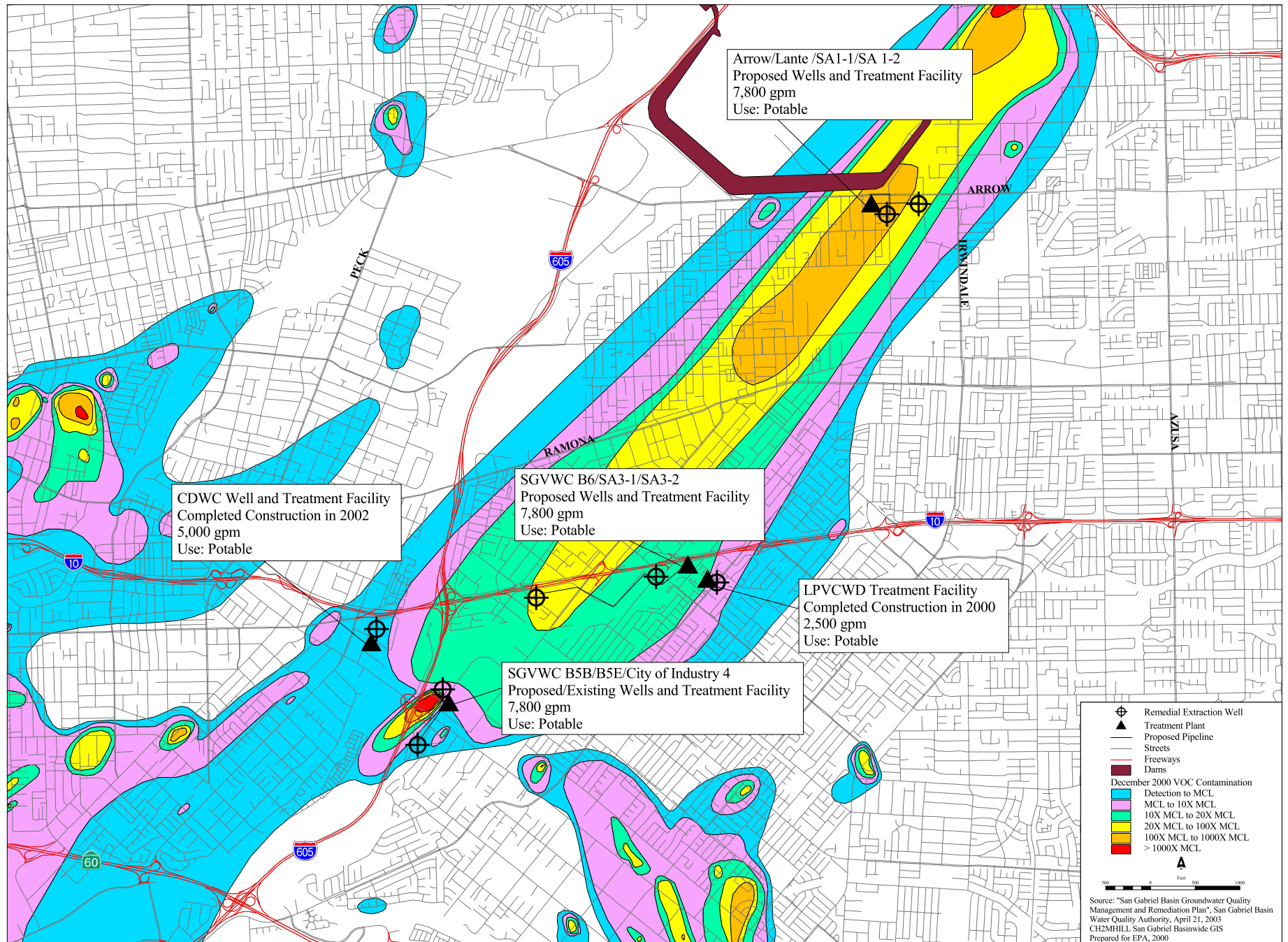


Figure 2

South El Monte Operable Unit

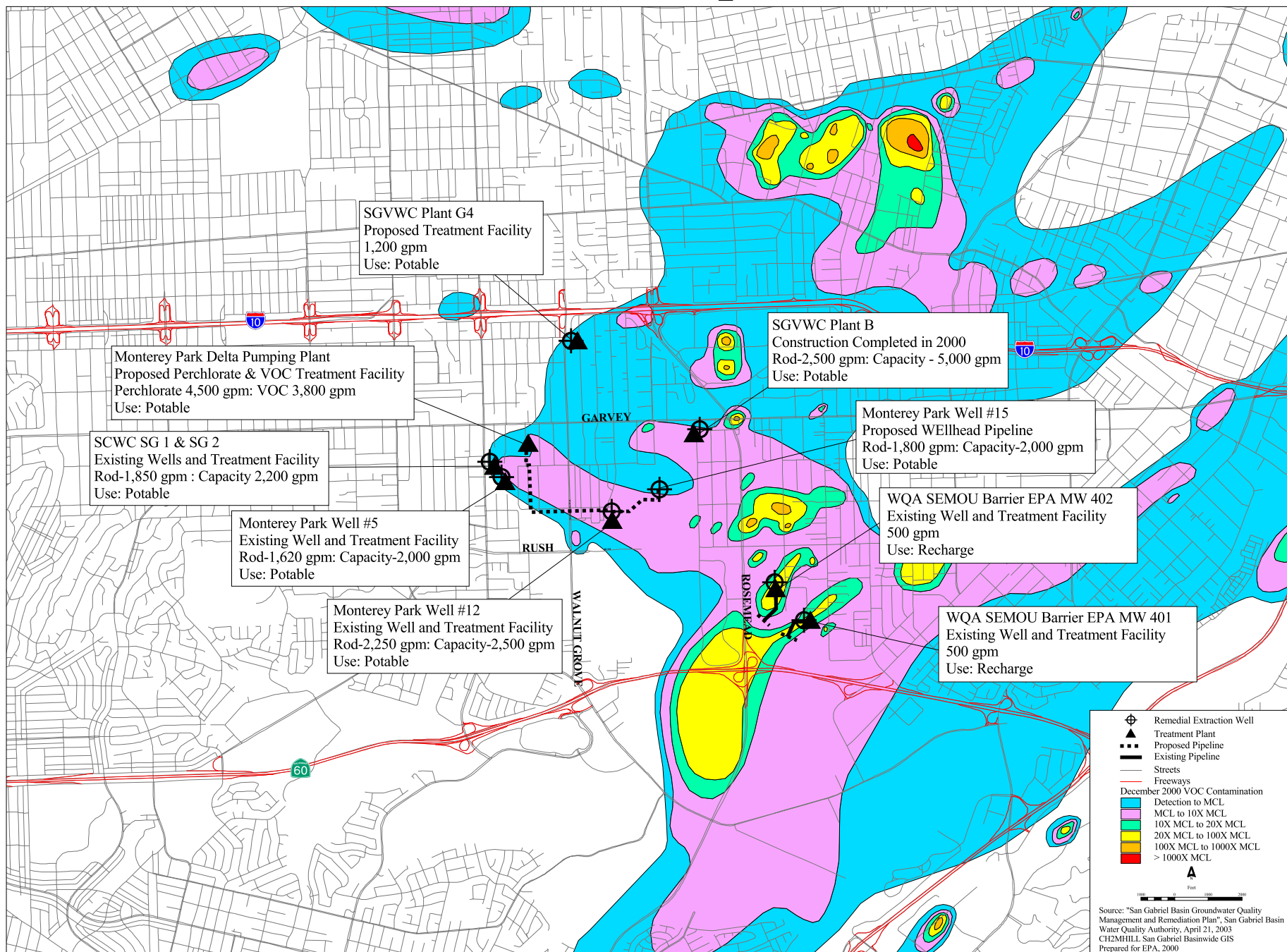


Figure 3

El Monte Operable Unit

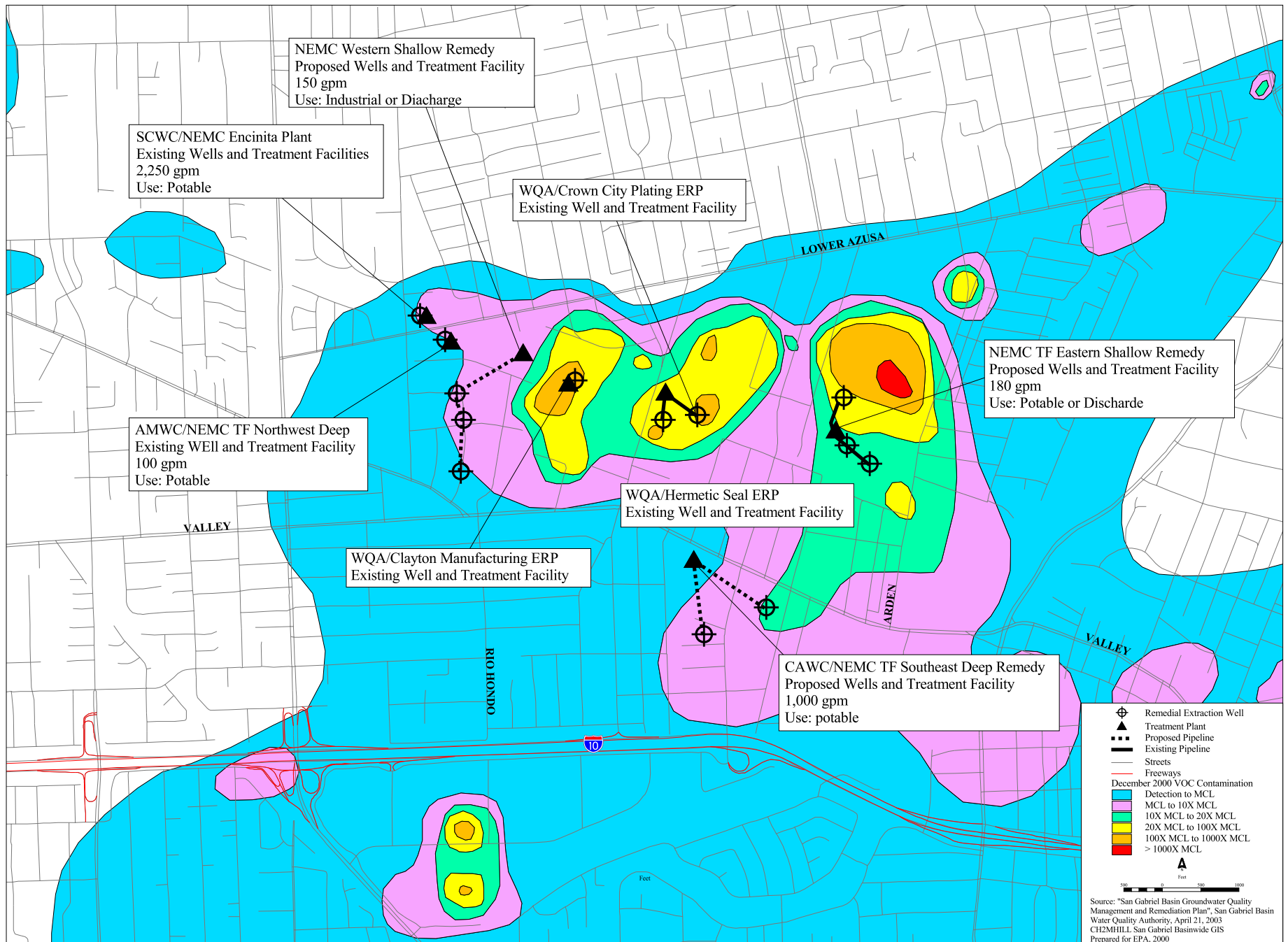


Figure 4

Whittier Narrows Operable Unit

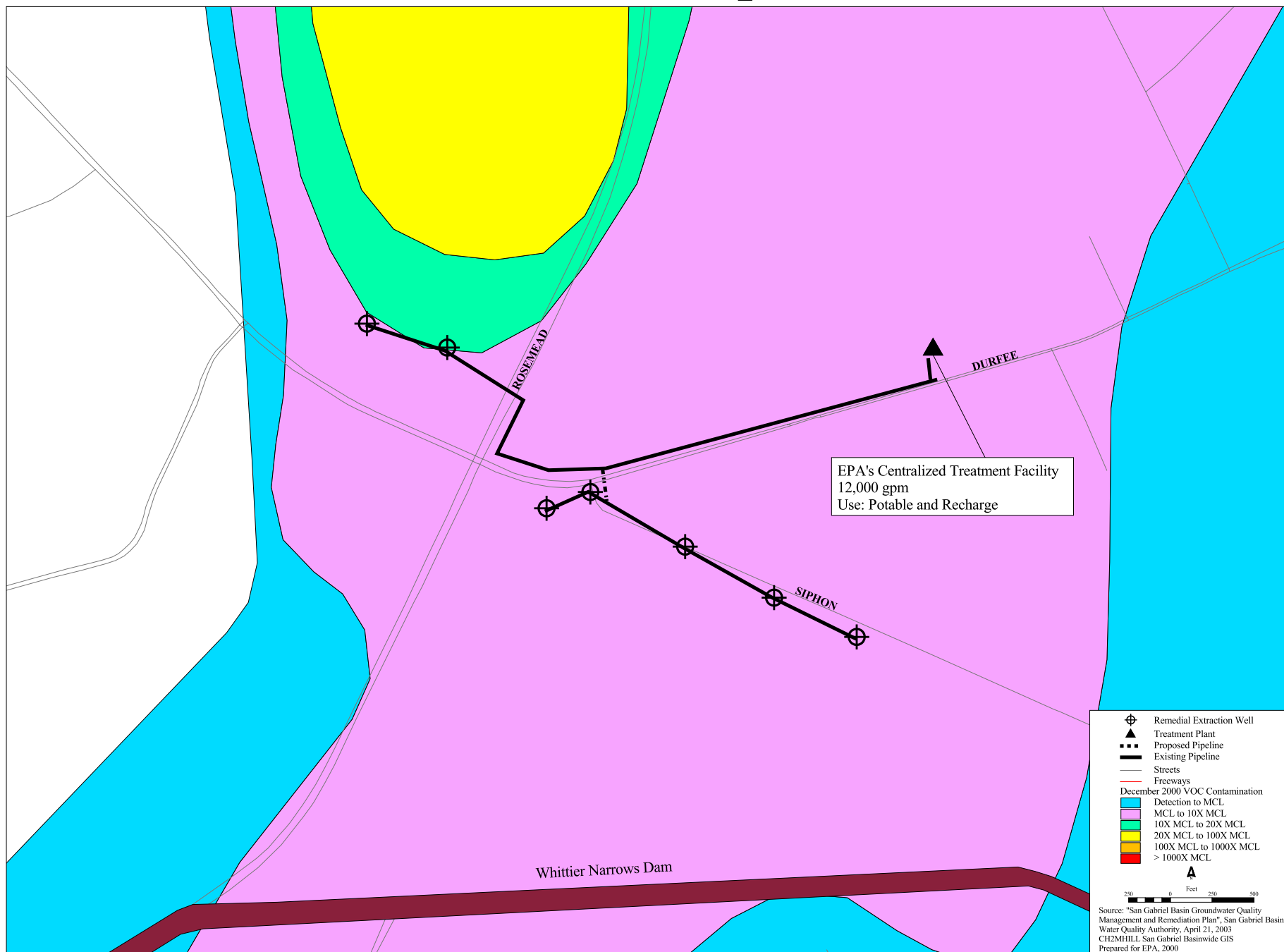


Figure 5

Puente Valley Operable Unit

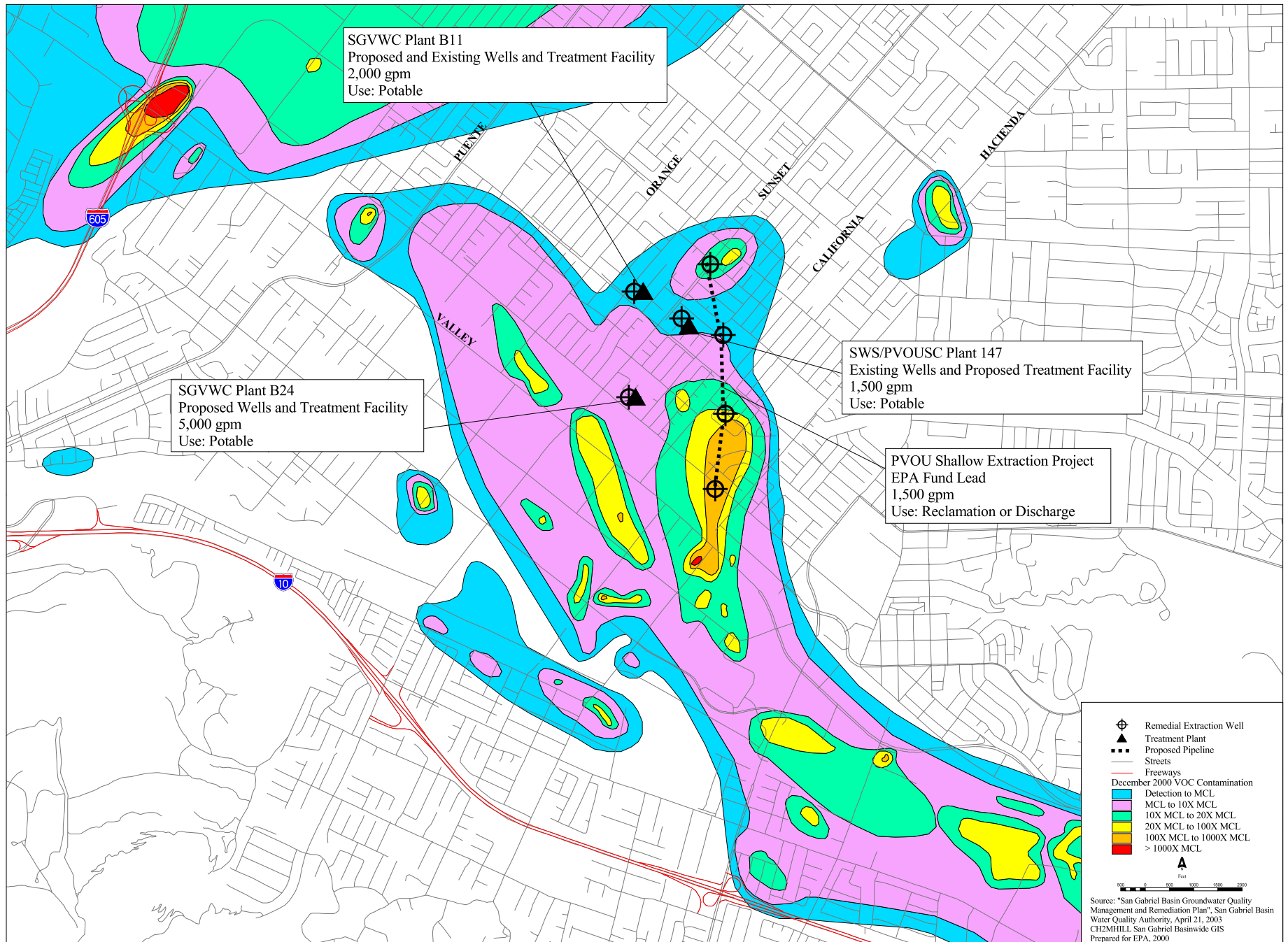


Figure 6

Alhambra Operable Unit

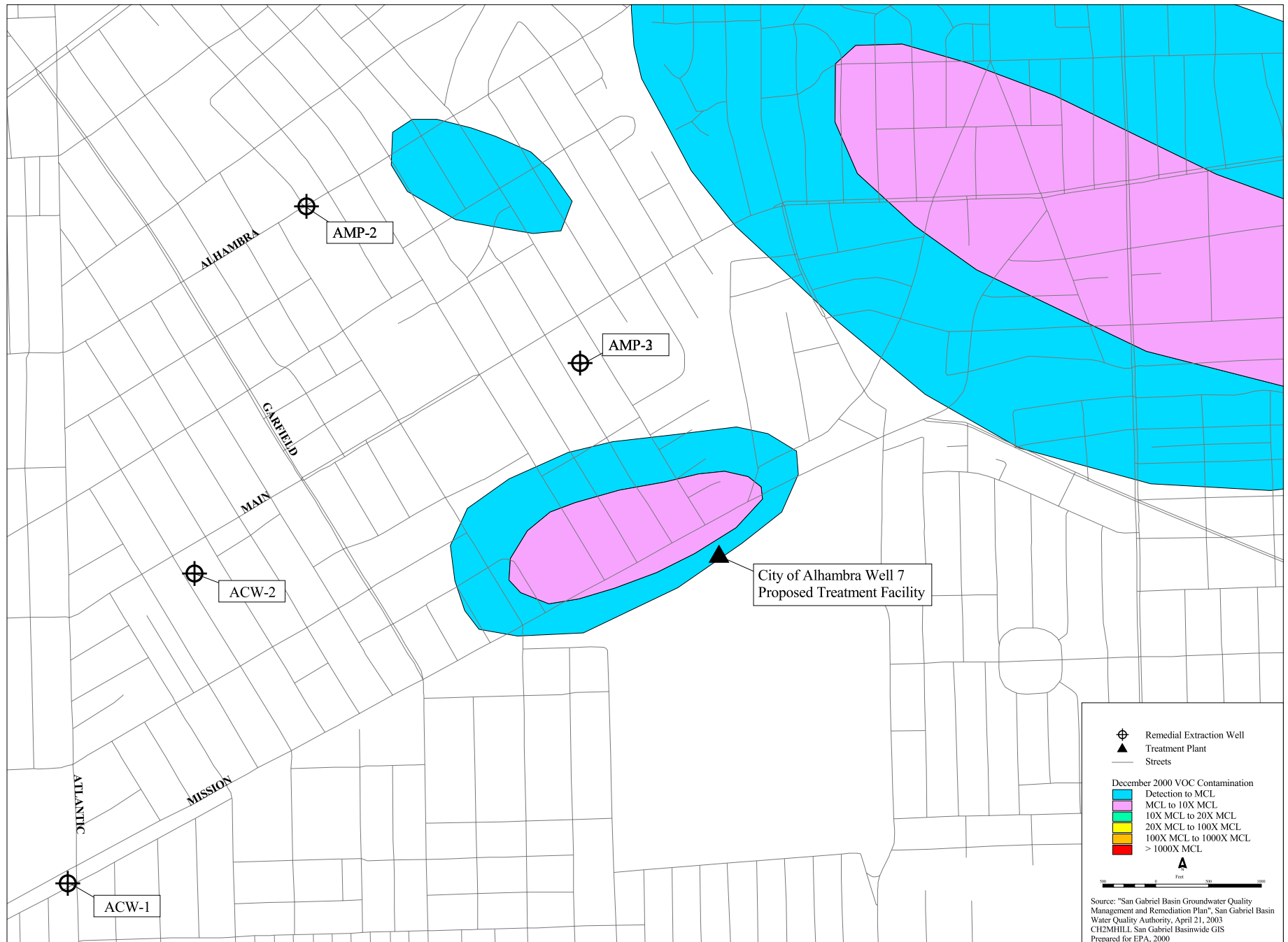


Figure 7

APPENDIX A

**Senate Bill No. 1679, Russell, September 1992
San Gabriel Basin Water Quality Authority**

CHAPTER 776

An act to create, and to repeal the act creating, the San Gabriel Basin Water Quality Authority, relating to water.

[Approved by Governor September 19, 1992. Filed with
Secretary of State September 21, 1992.]

LEGISLATIVE COUNSEL'S DIGEST

SB 1679, Russell. San Gabriel Basin Water Quality Authority.

(1) Under existing law, various agencies provide for the management of water in prescribed districts.

This bill would enact the San Gabriel Basin Water Quality Authority Act to create the San Gabriel Basin Water Quality Authority.

The bill would prescribe the organization, boundaries, management, powers, duties, and financing of the authority. The bill would require the authority to be administered by a 5-member governing body known as the San Gabriel Basin Water Quality Authority Board. The bill would require the Los Angeles Regional Water Quality Control Board to report to the Legislature on the progress of the authority, as prescribed.

The bill would impose a state-mandated local program by imposing various duties on local entities.

The bill would make these provisions, except for the report requirement, inoperative on the occurrence of 2 prescribed events. With a certain exception, the bill's provisions would be repealed on January 1, 1998, unless a later enacted statute extends or repeals that date.

(2) The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement, including the creation of a State Mandates Claims Fund to pay the costs of mandates which do not exceed \$1,000,000 statewide and other procedures for claims whose statewide costs exceed \$1,000,000.

This bill would provide that, if the Commission on State Mandates determines that this bill contains costs mandated by the state, reimbursement for those costs shall be made pursuant to those statutory procedures and, if the statewide cost does not exceed \$1,000,000, shall be made from the State Mandates Claims Fund.

The people of the State of California do enact as follows:

SECTION 1. This act shall be known and may be cited as the San Gabriel Basin Water Quality Authority Act.

— 2 —

Article 1. General Provisions

Sec. 101. The Legislature hereby finds and declares all of the following:

(a) Groundwater in the San Gabriel Valley in Los Angeles County is seriously contaminated with hazardous substances.

(b) The contamination is deep and widespread, with approximately 70 out of 275 wells contaminated in excess of maximum contaminant levels or state action levels for various volatile organic compounds and nitrates.

(c) The groundwater in the Main San Gabriel Basin is the primary source of drinking water for over 1,000,000 residents of the San Gabriel Valley.

(d) Strong and consistent local management of San Gabriel Valley groundwater cleanup is needed to protect and enhance water quality, ensure protection of the beneficial uses of the groundwater, and promote and foster the cleanup of this valuable resource.

(e) There is no existing local entity which has all of the necessary authority and jurisdiction to carry out the financial and institutional arrangements necessary to coordinate an effective cleanup program.

(f) (1) The watermaster for the Main San Gabriel Basin was appointed by the Superior Court in and for the County of Los Angeles, pursuant to a judgment entered upon the stipulation of all of the parties with water rights in the Main San Gabriel Basin, to regulate the extraction and replenishment activities in that basin. Nothing in this act is intended to expand the authority granted to the watermaster in the judgment.

(2) The watermaster has developed a program for the management of the Main San Gabriel Basin, which includes all of the following:

(A) Regulation of water rights.

(B) Imposition of an annual safe yield for the basin.

(C) Development of a plan for the importation of water into the Main San Gabriel Basin for the purpose of replenishment, including a plan to accomplish the long-term conjunctive use of the basin's groundwater storage capacity.

(D) Regulation of groundwater production.

(E) Implementation of procedures for compliance with water supply requirements relating to the lower San Gabriel Basin.

(F) Regulation of groundwater pumping activities for purposes of water quality protection.

(G) Monitoring groundwater quality and collection of groundwater quality data.

(H) Preparation of an annual five-year water quality and supply plan.

(I) Coordination of activities with the joint powers authority.

(g) The joint powers authority has developed cleanup programs

to clean up the Main San Gabriel Basin, which include all of the following:

(1) Characterization of basin contamination.

(2) Development and implementation of a comprehensive basin cleanup plan.

(3) A plan for financing the design, construction, operation, and maintenance of groundwater cleanup facilities.

(4) Provision for a public information program.

(5) Coordination with federal, state, and local entities.

(h) The Legislature intends that the watermaster, the joint powers authority, and the San Gabriel Basin Water Quality Authority, as the successor to the joint powers authority, continue to coordinate their respective groundwater management responsibilities and meet periodically to review, evaluate, and modify, as needed, the division of responsibilities for managing groundwater cleanup in the basin.

Sec. 102. It is the intent of the Legislature in enacting this act:

(a) To create the San Gabriel Basin Water Quality Authority to protect the public health and safety by planning and financing groundwater extraction and treatment projects to be carried out by the authority in the Main San Gabriel Basin, to provide potable water for beneficial uses in the basin, and to contribute to the basinwide remedial objectives established by state and federal agencies.

(b) To encourage the San Gabriel Basin Water Quality Authority to cooperate with the State Water Resources Control Board, the Los Angeles Regional Water Quality Control Board, the State Department of Health Services, the United States Environmental Protection Agency, the Metropolitan Water District of Southern California, the Main San Gabriel Basin Watermaster, and other appropriate agencies, in carrying out the requirements and purposes of this act.

(c) That the cleanup of contaminated groundwater authorized by this act be undertaken so as to do both of the following:

(1) Prevent or minimize, to the extent feasible, the migration of contaminated groundwater from the Main San Gabriel Basin into the Central and West Water Basins.

(2) Use reasonable, technically sound, and cost-effective measures to ensure that groundwater extracted from the Main San Gabriel Basin will meet applicable regulatory standards for the beneficial uses of the water.

(d) That, because of the pervasive nature and multiple sources of contamination in the San Gabriel Valley, appropriate credit should be given for the amount of prior groundwater investigation and remediation expenditures by any responsible party when determining the amount of costs recoverable from that party.

(e) That, if the costs of any removal or remedial action project are increased as a result of conjunctive use, those increased costs shall not be costs recoverable from responsible parties.

Article 2. Creation and Boundaries

Sec. 201. The San Gabriel Basin Water Quality Authority is hereby created.

Sec. 202. The boundaries of the authority are as follows:

Beginning at the southwest corner of Section 14, Township 1 North, Range 11 West, San Bernardino Base and Meridian;

Thence north along the west line of Section 14 to the northwest corner of the south half of Section 14;

Thence east along the north line of the south half of Section 14 to the east line of Section 14;

Thence north along the east line of Section 14 and continuing north along the east line of Section 11 to the northeast corner of Section 11;

Thence east along the north line of Section 12 to the northeast corner of Section 12;

Thence south along the east line of Section 12 and continuing south along the east line of Section 13 to the southeast corner of Section 13, the corner being also the southwest corner of Section 18, Township 1 North, Range 10 West;

Thence east along the south line of Sections 18, 17, 16, and 15, Township 1 North, Range 10 West to the southwest corner of Section 14;

Thence north along the west line of Section 14 to the northwest corner of the south half of Section 14;

Thence east along the north line of the south half of Section 14 to the east line of the section;

Thence north along the east line of Section 14, and continuing north along the west line of Section 12 to the north line of Section 12;

Thence, east along the north line of Section 12, to the northeast corner of Section 12, the corner being also the southwest corner of Section 6, Township 1 North, Range 9 West;

Thence north along the west line of Section 6 and continuing north along the west line of Sections 31 and 30, Township 2 North, Range 9 West to the westerly prolongation of the north line of Section 30;

Thence, east along the westerly prolongation of the north line of Section 30 and continuing east along the north line of Section 29 to the northeast corner of Section 29;

Thence south along the east line of Section 29 and continuing south along the east line of Section 32, Township 2 North, Range 9 West, and thence continuing south along the east line of Section 5, Township 1 North, Range 9 West to the southeast corner of Section 5;

Thence west along the south line of Section 5 to the southwest corner of Section 5, the point being also the northwest corner of Section 8;

Thence south along the west line of Section 8 and continuing south along the west line of Section 17 to the southwest corner of Section 17, the corner being also the northwest corner of Section 20;

Thence east along the north line of Sections 20 and 21 to the northwest corner of Section 22, the corner being also the southwest corner of Section 15;

Thence north along the west line of Section 15 to the northwest corner of the south half of Section 15;

Thence east along the north line of the south half of Section 15 to the northeast corner of the south half of Section 15;

Thence south along the east line of Section 15 and continuing south along the east line of Section 22 to the southeast corner of Section 22, the point being also the southwest corner of Section 23;

Thence east along the south line of Sections 23 and 24 to the east line of the west half of Section 24;

Thence north along the east line of the west half of Section 24 to the north line of the section;

Thence east along the north line of Section 24 to the northeast corner of the section, the point also being the northwest corner of Section 19, Township 1 North, Range 8 West;

Thence east along the north line of Sections 19 and 20, Township 1 North, Range 8 West to the northeast corner of Section 20;

Thence south along the east line of Sections 20, 19, and 32, Township 1 North, Range 8 West to the southeast corner of Section 32;

Thence west along the south line of Section 32 to the northwest corner of the east half of Section 5, Township 1 South, Range 8 West;

Thence south along the west line of the east half of Section 5 of the south line of Section 5;

Thence west to the east line of the northerly prolongation of Range 9 West;

Thence south 67 degrees 30 minutes west to an intersection with the northerly prolongation of the west line of Section 27, Township 1 South, Range 9 West;

Thence south along the northerly prolongation of the west line of Section 27 and continuing south along the west line of Section 27 to the southwest corner of Section 27, the point being also the southeast corner of Section 28;

Thence west along the south line and westerly prolongation of the south line of Section 28 to the northerly prolongation of the west line of Range 9 West;

Thence south along the prolongation of the west line of Range 9 West to the westerly prolongation of the north line of Township 2 South;

Thence west along the westerly prolongation of the north line of Township 2 South, a distance of 8,500 feet;

Thence south a distance of 4,500 feet;

Thence west a distance of 10,700 feet;

Thence south 29 degrees west to the intersection with the northerly prolongation of the west line of Section 20, Township 2 South, Range 10 West;

Thence south along the northerly prolongation of the west line of Section 20 and continuing south along the west line of Section 20 to the southwest corner of Section 20;

Thence south a distance of 2,000 feet;

Thence west a distance of two miles, more or less, to the intersection with the east line of Section 26, Township 2 South, Range 11 West;

Thence north along the east line of Section 26 and continuing north along the east line of Section 23, Township 2 South, Range 11 West to the northeast corner of Section 23;

Thence west along the north line of Section 23 to the northwest corner of the section, the point being also the southeast corner of Section 15, Township 2 South, Range 11 West;

Thence north and west along the east and north lines, respectively, of Section 15, Township 2 South, Range 11 West, to the northwest corner of the section;

Thence west along the westerly prolongation of the north line of Section 15, Township 2 South, Range 11 West to the intersection with a line parallel to, and one mile east of, the west line of Range 11 West;

Thence north along the parallel line to the intersection with the northerly boundary of the City of Pico Rivera as that city existed on July 17, 1970;

Thence west along that city boundary to the intersection with the east line of Range 12 West;

Thence north along the east line of Range 12 West to the north line of Township 2 South;

Thence west along the north line of Township 2 South to the intersection with the southerly prolongation of the east line of the west half of Section 26, Township 1 South, Range 12 West;

Thence north along the southerly prolongation of the east line of the west half of Section 26 to the southeast corner of the west half;

Thence west along the south line of Sections 26, 27, and 28, Township 1 South, Range 12 West to the southeast corner of Section 29, Township 1 South, Range 12 West;

Thence north along the east line of Section 29 to the northeast corner of the south half of Section 29;

Thence west along the north line along the south half of Section 29 to the northwest corner of the section;

Thence north along the west line of Sections 29, 20, 17, and 8, Township 1 South, Range 12 West;

Thence north along the northerly prolongation of the west line of Section 8, Township 1 South, Range 12 West to the intersection with the north line of Township 1 south;

Thence east along the north line of Township 1 south to the northeast corner of Section 3, Township 1 South, Range 12 West;

Thence north 64 degrees 30 minutes east to the intersection with the west line of Section 23, Township 1 North, Range 11 West;

Thence north along the west line of Section 23 to the northwest corner of the section, the point being the southwest corner of Section 14, Township 1 North, Range 11 West and the point being also the point of beginning.

Article 3. Definitions

Sec. 301. Unless the context otherwise requires, the definitions in this article govern the construction of this act.

Sec. 302. "Authority" means the San Gabriel Basin Water Quality Authority.

Sec. 303. "Board" means the San Gabriel Basin Water Quality Authority Board, which is the governing body of the authority.

Sec. 304. "Board member" or "member" means a member of the board.

(a) "Alternate member" or "alternate" means the nominee receiving the second highest number of votes in an election of a city member or the person appointed by a water district to act in the place of a member if that member is absent or the member has vacated the office.

(b) "City member" means a member elected by the cities with pumping rights or the cities without pumping rights.

(c) "Water district member" means a member appointed by one of the water districts.

Sec. 305. "City" means a city which partially or entirely overlies the Main San Gabriel Basin or a city which has, or may acquire, the right to pump water from the basin.

(a) "Cities with pumping rights" means cities which have pumping rights in the basin in accordance with the judgment and includes the Cities of Alhambra, Arcadia, Azusa, Covina, El Monte, Glendora, Industry, Irwindale, La Verne, Monrovia, Monterey Park, South Pasadena, and Whittier.

(b) "Cities without pumping rights" means cities which do not have pumping rights in the basin in accordance with the judgment and includes the Cities of Baldwin Park, Bradbury, Duarte, La Puente, Rosemead, San Dimas, San Gabriel, San Marino, Sierra Madre, South El Monte, Temple City, and West Covina.

Sec. 306. "Groundwater" means water beneath the surface of the ground and within the zone of saturation.

Sec. 307. "Groundwater basin" means an interconnected and permeable geologic formation capable of storing and yielding substantial groundwater supply.

Sec. 308. "Joint powers authority" means the entity formed pursuant to the "Joint Exercise of Powers Agreement Creating Main San Gabriel Basin Water Quality Authority," dated July 27, 1990, by and among the Upper San Gabriel Valley Municipal Water District,

the San Gabriel Valley Municipal Water District, and the Three Valleys Municipal Water District.

Sec. 309. "Judgment" means the judgment, as amended or as it may be amended, of the Superior Court in and for the County of Los Angeles in Upper San Gabriel Valley Municipal Water District v. City of Alhambra (Case Number 924128).

Sec. 310. "Main San Gabriel Basin" or "basin" means the groundwater basin underlying the land within the boundaries of the authority.

Sec. 311. "Produce" means to pump water from the basin.

Sec. 312. "Producer" means a person or entity that produces water.

Sec. 313. "Public water system" means any entity that operates a public water system, as defined in subdivision (f) of Section 4010.1 of the Health and Safety Code.

Sec. 314. "Pumping right assessment" means an assessment on prescriptive pumping rights levied by the authority upon the holder of a prescriptive pumping right, as determined under the judgment.

Sec. 315. "Water district" means the San Gabriel Valley Municipal Water District, the Upper San Gabriel Valley Municipal Water District, or the Three Valleys Municipal Water District.

Sec. 316. "Watermaster" means the watermaster appointed to administer the judgment.

Article 4. Powers and Purposes

Sec. 401. The authority may do any of the following:

(a) Coordinate groundwater remediation planning and implementation activities among the water districts, the producers, and the authority.

(b) Control and remove hazardous substances from the basin.

(c) Construct, operate, and maintain water treatment facilities which benefit the basin.

(d) Receive and expend funds obtained from all of the following sources:

(1) Federal, state, or local governments.

(2) Nongovernmental entities.

(3) The proceeds from the issuance of bonds, notes, warrants, and other indebtedness to finance treatment projects which benefit the basin.

(4) Pumping right assessments.

Sec. 402. The authority may undertake projects which relate to, but are not limited to, efforts to correct water quality problems due to volatile organic compounds, nitrates, and mineral salts. These projects shall be undertaken pursuant to, and shall be consistent with, the basinwide plan adopted under Section 406.

Sec. 403. The authority may do any of the following:

(a) Employ agents and employees.

(b) Make and enter into contracts.

(c) Sue and be sued in its own name and, to the extent authorized by Section 407, bring suits to recover, from responsible parties, the removal and remedial action costs incurred by the authority.

(d) Adopt a seal and alter it at pleasure.

(e) Acquire, construct, manage, maintain, and operate any buildings, works, or improvements, both inside and outside the boundaries of the authority.

(f) Acquire, own, hold, or dispose of property both inside and outside the boundaries of the authority.

(g) Incur debts, liabilities, and obligations.

(h) Issue bonds, notes, and warrants and other evidence of indebtedness and enter into leases, installment sales contracts, and other agreements to finance costs and expenses incidental to the projects of the authority.

(i) Enter into agreements with the watermaster and other appropriate entities to do any of the following:

(1) Store water in the basin.

(2) Purchase and import water for the benefit of the authority.

(3) Exchange water.

(4) Distribute water to producers in exchange for ceasing or reducing groundwater extraction.

(5) Regulate pumping in accordance with the judgment.

(j) Own and operate facilities to extract, purify, and treat water for the beneficial use of persons or property within the authority.

(k) Acquire, within or outside the authority and within the state, by purchase, condemnation, or other legal means, all property, or rights in property, that the authority determines to be necessary or proper for the purposes of the authority, except that the authority shall not exercise the power of eminent domain as to water, water rights, reservoirs, pipelines, water distribution systems, waterworks, or powerplants that are devoted to beneficial or public use. Eminent domain proceedings may be brought by the authority for these purposes pursuant to Title 7 (commencing with Section 1230.010) of Part 3 of the Code of Civil Procedure.

(l) Act jointly or cooperate, within or outside the boundaries of the authority, with the United States, the state, a county, city, or district, the watermaster, or any corporation, or person to carry out this act.

(m) Carry on technical and other investigations of all kinds necessary to carry out the purposes of this act.

(n) Levy pumping right assessments and impose charges for the sale of groundwater extracted and treated by the authority to pay for the administrative costs of the authority, to pay for the operation and maintenance costs of facilities including reasonable reserves for operation and maintenance costs, to repay warrants, notes, bonds, and other evidence of indebtedness, to make payments pursuant to leases or installment sale agreements in connection with certificates

of participation, and to make payments pursuant to any other financial obligations. Pumping right assessments may be levied on, and are payable by, public agency holders of prescriptive rights under the judgment.

(o) Issue bonds, notes, warrants, other evidence of indebtedness or certificates of participation in contracts payable from the levy of pumping right assessments, the imposition of charges for the sale of groundwater extracted and treated by the authority, or with any other revenues legally available to the authority.

Sec. 404. No power granted to the authority expands, limits, supersedes, or otherwise impairs any authority granted to the watermaster under the judgment, except that any plan adopted by the authority pursuant to Section 401 or 406 is, for purposes of the judgment, a basin cleanup plan adopted by a public governmental agency with responsibility for groundwater management or cleanup. Any project undertaken by the authority which involves the pumping of groundwater from the basin is subject to regulation in accordance with the judgment.

Sec. 405. The authority may contract with appropriate entities to carry out the purposes of the act and the rules and regulations adopted pursuant to this act.

Sec. 406. (a) The authority shall develop and adopt a basinwide groundwater quality management and remediation plan. The authority shall cooperate with all appropriate entities for that purpose. The plan shall include, but not be limited to, all of the following components:

- (1) Characterization of basin contamination.
- (2) Development and implementation of a comprehensive basin cleanup plan.
- (3) A plan for financing the design, construction, operation, and maintenance of groundwater cleanup facilities.
- (4) Provision for a public information and participation program.
- (5) Coordination with federal, state, and local entities.

(b) The basin-wide plan shall be consistent with the National Contingency Plan and with any applicable records of decision issued by the United States Environmental Protection Agency, all requirements of the Los Angeles Regional Water Quality Control Board, including that board's Basin Plan, and all applicable agreements between federal, state, and local agencies engaged in cleanup activities. The basinwide plan shall consider the benefits to be achieved by the plan or any proposed project in relation to its economic impact on persons or entities within the boundaries of the authority.

Sec. 407. (a) The authority may cooperate with the Los Angeles Regional Water Quality Control Board and the United States Environmental Protection Agency in their investigation and identification of persons or entities that are responsible for the contamination of the basin.

(b) Persons or entities responsible for the contamination of the basin shall cooperate with the authority in developing and implementing plans for the cleanup of the contamination.

(c) To the extent authorized under Section 107 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (42 U.S.C. Sec. 9607), or Chapter 6.8 (commencing with Section 25300) of Division 20 of the Health and Safety Code, the authority may pursue legal action against persons or entities that are responsible for the contamination of the basin to recover removal or remedial action costs incurred by the authority for the cleanup of the contamination attributable to that person or entity, including the costs of enforcement and litigation.

Article 5. Organization

Sec. 501. The authority shall be governed by the board. The powers and duties of the authority shall be exercised by and through the board.

Sec. 502. (a) The board shall be composed of five members, three of whom are appointed by the water districts and two of whom are elected by the cities.

(b) No person who, directly or indirectly, at the time of election or appointment, receives, or during the two-year period immediately preceding election or appointment received, 10 percent or more of his or her income from any person or public entity subject to regulation by, or that receives grants from or contracts for work with, the authority may serve as a member of the authority.

Sec. 503. The water district members and their alternates shall be appointed as follows:

(a) One member and one alternate shall be appointed by the Board of Directors of the Upper San Gabriel Valley Municipal Water District. The member and alternate appointed pursuant to this subdivision shall be elected members of that board and shall be appointed by resolution adopted by a majority of that board.

(b) One member and one alternate shall be appointed by the Board of Directors of the San Gabriel Valley Municipal Water District. The member and alternate appointed pursuant to this subdivision shall be elected members of that board and shall be appointed by resolution adopted by a majority of that board.

(c) One member and one alternate shall be appointed by the Board of Directors of the Three Valleys Municipal Water District. The member and alternate appointed pursuant to this subdivision shall be elected members of that board and shall be appointed by resolution adopted by a majority of that board.

Sec. 504. The city members and their alternates shall be elected as follows:

(a) One member and one alternate shall be elected by the cities

with pumping rights. The member and alternate elected pursuant to this subdivision shall be city council members from cities with pumping rights.

(b) One member and one alternate shall be elected by the cities without pumping rights. The member and alternate elected pursuant to this subdivision shall be city council members from cities without pumping rights.

Sec. 505. Each of the members elected by the cities pursuant to Section 504 shall be elected according to the following procedure:

(a) A city with pumping rights may vote for candidates to be elected to represent cities with pumping rights. A city without pumping rights may vote for candidates to be elected to represent cities without pumping rights. The number of votes which a city may cast is determined by the population of the city. Each city has one vote for each 10,000 residents or majority fraction thereof, as determined by the most recent United States decennial census data. The number of votes to which a city is entitled shall be computed by rounding the population of the city to the nearest 10,000 and dividing that number by 10,000. Each city has a minimum of one vote.

(b) An election for a city member shall be conducted at the board's final regular meeting of the calendar year preceding the expiration of the term of the office of that city member.

(c) Nominations for candidates for a city member elected by cities with pumping rights may be made by any city with pumping rights. Nominations for candidates for a city member elected by cities without pumping rights may be made by any city without pumping rights. Each city may nominate only one candidate for each office. Nomination shall be made by resolution of the city council of the nominating city. All nominations shall be submitted to the authority at least 60, but not more than 90, days preceding the meeting at which the election is to be held.

(d) The authority shall adopt procedures for preparing and distributing ballots to each city eligible to vote in the election. Ballots shall be distributed to all cities which are eligible to vote at least 45 days prior to the meeting at which the election is to be held. Each ballot shall indicate the number of votes which the city is entitled to cast.

(e) Each city shall cast all of its votes for one candidate for each office, by resolution of the city council. The resolution casting the city's votes shall be delivered to the authority at least 24 hours before the meeting at which the election is held. Any resolutions not received by the authority 24 hours before the election may not be counted.

(f) (1) The candidate receiving the highest number of votes cast by cities with pumping rights shall be elected to fill the office representing cities with pumping rights. The candidate receiving the next highest number of votes cast by cities with pumping rights, who is not a city council member from the same city as the candidate

receiving the highest number of votes, is the alternate member.

(2) The candidate receiving the highest number of votes cast by cities without pumping rights shall be elected to fill the office representing cities without pumping rights. The candidate receiving the next highest number of votes cast by cities without pumping rights, who is not a city council member from the same city as the candidate receiving the highest number of votes, is the alternate member.

(g) Not later than March 1, 1993, the joint powers authority shall call and conduct the election to elect the initial city members and alternates. Thereafter, the election of city members shall be called and conducted by the authority.

Sec. 506. An alternate member shall act in the place, and perform all of the duties, of the city member or water district member selected by the same cities or water district if that city member or water district member is absent from a meeting of the authority or has vacated his or her office until the vacancy is filled pursuant to this act.

Sec. 507. (a) Except as provided in subdivision (b), the terms of the members shall commence on the first Monday in January and each member shall hold office for a term of four years and until the successor takes office.

(b) With respect to the initial board members, the terms of the member appointed by the Three Valleys Municipal Water District and the member elected by the cities without pumping rights shall expire on January 1, 1995, and the terms of the remaining members shall expire on January 1, 1997.

Sec. 508. Any vacancy in the office of a member shall be filled as follows:

(a) A vacancy in the office of a member or alternate who was appointed by a water district shall be filled by the appointing water district by a resolution adopted by a majority vote of the district governing board. The person appointed to fill the vacancy shall meet the qualifications applicable to the vacant office and shall serve for the remaining term of the vacant office.

(b) A vacancy in the office of a member or alternate who was elected by cities shall be filled by a special election called by the authority. Only those cities which elected the member or alternate to the office in which the vacancy has occurred are eligible to vote. Nominations and balloting shall be conducted in the same manner as a regular election, except that the date of the election and time periods shall be as prescribed by the authority. The member or alternate elected to fill a vacancy shall meet the qualifications applicable to the vacant office and shall serve for the remaining term of the vacant office.

Sec. 509. The board shall annually elect from its membership a chairperson, vice chairperson, secretary, and treasurer. The board may appoint additional officers and employ additional employees

and assistants that may be necessary or appropriate.

Sec. 510. A majority of the board constitutes a quorum for transaction of business of the authority.

Sec. 511. Except as otherwise provided, all actions of the board shall be approved by an affirmative vote of a majority of all of the members.

Sec. 512. Each member shall receive compensation for each meeting of the board attended, which amount shall be fixed from time to time by the board, but shall not exceed the amount allowed by law for members of the board of a municipal water district.

Sec. 513. All meetings of the board shall be open to the public and shall be held in accordance with the Ralph M. Brown Act (Chapter 9 (commencing with Section 54950) of Part 1 of Division 2 of Title 5 of the Government Code).

Sec. 514. The board shall adopt rules and regulations for the conduct of its affairs.

Sec. 515. Each of the officers, employees, and assistants shall serve at the pleasure of the board and shall perform the duties and have the authority as determined by the board.

Article 6. Financial Provisions

Sec. 601. The authority may accept federal, state, and local funds which are available for purposes of groundwater cleanup and for otherwise implementing this act. The authority may accept grants and donations to carry out the purposes of this act. The limits on bonded indebtedness shall be exclusive of grants and donations.

Sec. 602. The authority may impose an annual pumping right assessment which may not exceed five dollars (\$5) per acre-foot to pay for administrative costs. The amount of the assessment shall be established at an amount equal to the amount needed to pay for administrative costs. The assessment authorized by this section shall not be used to replace federal, state, or other money which is available to the authority.

Sec. 603. The authority may issue warrants, in an aggregate amount not to exceed four hundred thousand dollars (\$400,000), to pay for the costs of formation of the authority. The warrants may bear interest at a rate not exceeding 8 percent per year from the date of issuance until funds are available to pay the warrants. Warrants for the costs of formation shall be repaid by the levy of a pumping right assessment pursuant to Section 602, the imposition of a charge for the sale of groundwater extracted and treated by the authority, or with other available revenue.

Sec. 604. (a) The authority may issue negotiable promissory notes and bond anticipation notes to acquire funds for any purposes authorized by this act subject to Sections 71810, 71811, 71812, 71813, and 71814 of the Water Code.

(b) Promissory notes, bond anticipation notes, bonds, certificates

of participation, and other evidences of indebtedness issued by the authority shall be payable from any revenues or moneys of the authority available therefore and not otherwise pledged and shall be negotiable even though they are payable from special funds. The authority may do any of the following with regard to any notes, bonds, certificates, or other evidences of indebtedness:

(1) Sell them at public or private sale for prices, and upon terms and conditions, determined by the authority.

(2) Sell them as serial or term instruments or both.

(3) Have them bear dates, and mature at times, not to exceed 20 years from their respective dates, bear interest at rates, be payable at times, be in denominations, be in forms, either coupon or registered, carry registration privileges, be executed in the manner, be payable in lawful money of the United States at places, and be subject to terms of redemption as the indenture, trust agreement, or resolution relating to those instruments provides.

(4) Secure them by a trust agreement or indenture by and between the authority and a corporate trustee or trustees, which may be any trust company or bank having the powers of a trust company within or outside the state. The trust agreement, indenture, or the resolution providing for the issuance of the instruments, may pledge or assign the revenues of the authority under the provisions of this act. The indenture, trust agreement, or resolution providing for the issuance of the instruments may contain provisions for protecting and enforcing the rights and remedies of the holders determined by the authority to be reasonable and proper and not in violation of law. Any trust agreement or indenture may set forth the rights and remedies of the holders and of the trustee or trustees, and may restrict the individual right of action of holders. In addition, the indenture, trust agreement, or resolution may contain other provisions determined by the authority to be reasonable and proper for the security of the holders.

(c) Any evidence of indebtedness issued under this act does not constitute a debt of the state or of any political subdivision thereof or a pledge of the faith and credit of the state or of any political subdivision, other than the authority, but shall be payable solely from the funds of the authority specified in this act. All instruments of debt shall contain on the face thereof a statement to the effect that neither the state nor the authority is required to pay the same, or the interest thereon, except from certain revenues of the authority and that neither the faith and credit nor the taxing power of the state or of any political subdivision is pledged to the payment of the principal of, or the interest on, those instruments. The issuance of instruments of debt under the provisions of this act shall not require the state or any political subdivision thereof to levy or to pledge any form of taxation or to make any appropriation for their payment.

(d) Any holder of instruments of debt issued under this act or any of the coupons appertaining thereto, and the trustee or trustees

under any indenture or trust agreement, except to the extent the rights granted in this act may be restricted by any resolution authorizing the issuance of, or any such indenture or trust agreement securing, the instruments, may, either at law or in equity, by suit, action, mandamus, or other proceedings, protect and enforce any and all rights granted by state law, this act, resolution, indenture, or trust agreement, and may enforce and compel the performance of all duties required by this act or by the resolution, indenture, or trust agreement to be performed by the authority or by any officer, employee, or agent thereof.

(e) The authority may provide for the issuance of instruments of debt of the authority for the purpose of refunding any instruments of debt or any series or issue of instruments of outstanding debt of the authority, including the payment of any redemption premium thereon and any interest accrued, or to accrue, to the date of redemption until the purchase or maturity of instruments of debt.

(f) Any instruments of debt issued under this act, their transfer, and the income therefrom, are not subject to taxation by the state or any political subdivision of the state.

(g) The state does pledge to, and agree with, the holders of the instruments of debt issued pursuant to this act, and with those parties who may enter into contracts with the authority pursuant to the provisions of this act, that the state will not limit, alter, or restrict the rights vested in the authority to fulfill the terms of any agreements made with the holders of instruments of debt authorized by this act, and with the parties who may enter into contracts with the authority pursuant to the provisions of this act, or in any way impair the rights or remedies of the holders of the instruments of debt or the parties until the instruments of debt, together with interest thereon, are fully paid and discharged and the contracts are fully performed on the part of the authority. The authority as a public body corporate and politic may include the pledge herein made in its debt instruments and contracts.

Sec. 605. The authority may impose an annual pumping right assessment, not to exceed thirty-five dollars (\$35) per acre-foot, to construct facilities and acquire property, to retire promissory notes, bond anticipation notes, bonds and certificates of participation and other evidences of indebtedness, and to pay for operations and maintenance of projects constructed by and for the authority. The authority shall impose an assessment pursuant to this section for operation and maintenance purposes only if, and to the extent that, money for operation and maintenance purposes is not received from other sources after reasonable efforts have been made to secure that funding. However, no assessment shall be imposed for water extracted pursuant to a conjunctive use storage agreement between the producer and the watermaster, which the authority has approved.

Sec. 606. A pumping right assessment imposed pursuant to this

act shall be imposed upon the holder of a prescriptive pumping right at a uniform rate per acre-foot of prescriptive pumping right.

Sec. 607. The authority may exempt a producer from all or part of the annual pumping right assessment established pursuant to Section 605 for water pumped and treated from a contaminated well if, with the prior approval of the authority for the project, the producer funds the design and construction of the wellhead treatment system for that well.

Sec. 608. The authority may annually adjust the maximum assessments authorized pursuant to this act by an amount not to exceed the percentage change in the United States Consumer Price Index for the Los Angeles/Anaheim/Riverside area between January 1, 1993, and the date of the adjustment.

Sec. 609. (a) The authority may, by resolution of the board, impose a pumping right assessment pursuant to Section 605 only in accordance with this section and Sections 610 to 614, inclusive.

(b) Prior to levying a new assessment or approving an increase in an existing assessment, the authority shall hold at least one hearing at which presentations may be made.

(c) (1) Notice of the time and place of the hearing, including a general explanation of the matter to be considered and a statement of the amount of the assessment, shall be mailed, at least 90 days prior to the hearing, to each producer, each city, the watermaster, and any interested party who files a written request with the authority for notice of any hearing on a new or increased assessment.

(2) The authority shall also cause notice of the hearing to be posted at least 45 days prior to the date of the hearing at the entrance to the location where the hearing will be held and to be published, pursuant to Section 6066 of the Government Code, in a newspaper of general circulation printed and published within the boundaries of the authority, if there is one or, if not, in a newspaper printed and published in Los Angeles County.

(d) Each entity that operates a public water system for retail service within the boundaries of the authority shall prepare and include with its regular bill for charges sent to its customers a notice of the hearing at least 15 days prior to the hearing. The notice shall read as follows:

Notice of Public Hearing

On _____, at _____, at
(date) (time)

_____, the Board of Directors of the
(address)

San Gabriel Basin Water Quality Authority
will hold a protest hearing concerning a proposed
pumping right assessment of _____

(amount)

per acre-foot of groundwater produced. If added to the water bill, the assessment would amount to approximately _____ per month for an

(amount)

average residential customer. Registered voters seeking to protest the proposed assessment shall do so in a written communication filed with the Authority at _____ not

(address)

later than the time set for the hearing. Questions concerning the assessment or the protest hearing should be directed to the Authority at _____

(telephone)

Sec. 610. At the time and place set forth in the notice, the board shall conduct the hearing, and shall consider all objections or protests, if any, to the resolution referred to in the notice, and may continue the hearing from time to time. Upon the conclusion of the hearing, the board may adopt, revise, reduce, or withdraw the assessment. The board shall make its determination on the assessment described in the resolution, and the determination is final.

Sec. 611. Any registered voter seeking to protest the adoption or increase of an assessment shall do so in a written communication filed with the authority not later than the time set for the hearing. A protest by a registered voter shall include the name and residence address of the person making the protest and shall be signed and dated. A protest may be withdrawn at any time before the determination on the assessment by the board.

Sec. 612. If the board receives protests that are not withdrawn at the time of determination by the board, which represent 50 percent of the registered voters within the authority, no further proceedings may be conducted to adopt or increase an assessment until one year from the date of the initiation of the protest procedure.

Sec. 613. If the board receives protests that are not withdrawn at the time of determination by the board, which represent at least 15 percent, but less than 50 percent, of the registered voters within the authority, the board may adopt, revise, change, or reduce an assessment, but the adoption or modification of an assessment is not effective until approved by a majority of the voters in an election held within the authority.

Sec. 614. (a) If the board imposes an assessment pursuant to Section 605, the board may, by resolution, continue the assessment in successive years at the same or reduced rate.

(b) Prior to continuing the assessment, the authority shall hold at least one hearing at which presentations may be made.

(c) The authority shall cause notice of the intent to adopt the

resolution to be published pursuant to paragraph (2) of subdivision (c) of Section 609, and shall consider any and all objections at the time and place set forth in the notice.

(d) The board shall, at the time and place set forth in the notice, conduct the hearing and consider any objections or protests to the assessment. The board may overrule any and all objections. The board may, thereafter, adopt, reduce, or withdraw the assessment.

(e) The determination of the board is final.

(f) This section applies to the continuation of a previously imposed assessment only if the board does not propose to increase the amount of the assessment.

Article 7. Miscellaneous

Sec. 701. (a) The joint powers authority is dissolved upon the initial election of the city members pursuant to Section 505. The authority succeeds to all the properties, rights, obligations, and liabilities of the joint powers authority on the date of its dissolution.

(b) Any and all actions by or against the joint powers authority pending at the time of its dissolution may be prosecuted to final judgment by or against the authority.

(c) After the effective date of the dissolution of the joint powers authority, no action may be brought for or against the dissolved joint powers authority or its commissioners, officers, or employees, but may be prosecuted by or against the authority.

Sec. 702. This act shall be liberally construed to carry out its purposes.

Sec. 703. Except for Section 705, this act shall become inoperative when both of the following have occurred:

(a) The State Water Resources Control Board, with the concurrence of the State Department of Health Services, determines, in writing, that substantially all public water system wells within the basin are pumping water that is not contaminated, or not likely to become contaminated, in excess of federal or state safe drinking water standards. The authority shall pay a fee to the State Water Resources Control Board and to the State Department of Health Services, respectively, equal to the reasonable costs incurred by those agencies pursuant to this subdivision.

(b) All contracts, and bonds or other evidences of indebtedness, executed or issued by or on behalf of the authority have been satisfied.

Sec. 704. (a) The revenues of the authority collected from the assessment authorized by Section 605 and used by the authority to construct, or contribute to the construction of, capital projects for the cleanup of any site that has been listed on the National Priorities List established pursuant to subparagraph (B) of paragraph (8) of Section 105 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (42 U.S.C. Sec.

9605 (8) (B)) and is located within the Main San Gabriel Basin shall be credited to the state's 10-percent cost share obligation for capital costs under any program undertaken with the United States Environmental Protection Agency to clean up the sites.

(b) Nothing in this section precludes the authority from receiving from state agencies grants or loans for purpose of the cleanup of contaminated groundwater. Any such state grant or loan shall also be credited to the state's 10-percent cost share obligation.

Sec. 705. On or before January 1, 1997, the Los Angeles Regional Water Quality Control Board shall report to the Legislature on the progress of the authority with regard to actions undertaken pursuant to Article 4 (commencing with Section 401).

Sec. 706. (a) Except as provided in this section, this act shall remain in effect only until January 1, 1998, and as of that date is repealed, unless a later enacted statute, which is enacted before January 1, 1998, deletes or extends that date.

(b) Upon the repeal of this act, the assets and debts of the authority shall be administered as follows:

(1) The Los Angeles Regional Water Quality Control Board shall dispose of the property and assets as appropriate. The Los Angeles Regional Water Quality Control Board shall receive reimbursement for actual costs incurred related to the disposition of the property and assets. The cost recovery shall be from the proceeds of the disposition pursuant to this section. The proceeds, if any, of the disposition shall be transferred to the Treasurer to be applied to pay the debts of the authority and, if any proceeds remain, shall be transferred to the Treasurer for deposit in the Hazardous Substance Cleanup Fund for use in financing groundwater contamination investigation and remediation in the basin. Preference shall be given in the disposition of assets of the authority to transfers to producers who may be able to use the assets for the benefit of water distribution systems and to provide for continued operation and maintenance of the assets in order to further the purposes of this act.

(2) The Treasurer shall administer the payment of debts of the authority. The Treasurer shall apply the proceeds from the disposition of assets to the payment of the debts. If debts remain after application of the proceeds from disposition of assets, the Treasurer may continue to collect, in lieu of the authority, the pumping right assessments authorized under either (A) Section 602 if the debt relates to administrative costs or (B) Section 605 if the debt is to repay warrants, notes, bonds, and other evidences of indebtedness, or both, to make payments pursuant to leases or installment sale agreements in connection with certificates of participation, to pay for operation and maintenance costs of facilities, and to make payments pursuant to any other financial obligations. All provisions set forth in Article 6 (commencing with Section 601) relating to the levy and collection of the pumping right assessments are not repealed and shall continue in effect until the debts of the authority

are paid, as determined by the Treasurer, who shall notify the Secretary of State. Upon receipt by the Secretary of State of the Treasurer's notice, Article 6 (commencing with Section 601) is repealed. The Treasurer's authority to levy and collect assessments under this act is limited according to the provisions of this act and shall cease when all debts of the authority have been paid.

SEC. 2. If any provision of this act or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of the act which can be given effect without the invalid provision or application, and to this end the provisions of this act are severable.

SEC. 3. Notwithstanding Section 17610 of the Government Code, if the Commission on State Mandates determines that this act contains costs mandated by the state, reimbursement to local agencies and school districts for those costs shall be made pursuant to Part 7 (commencing with Section 17500) of Division 4 of Title 2 of the Government Code. If the statewide cost of the claim for reimbursement does not exceed one million dollars (\$1,000,000), reimbursement shall be made from the State Mandates Claims Fund. Notwithstanding Section 17580 of the Government Code, unless otherwise specified in this act, the provisions of this act shall become operative on the same date that the act takes effect pursuant to the California Constitution.

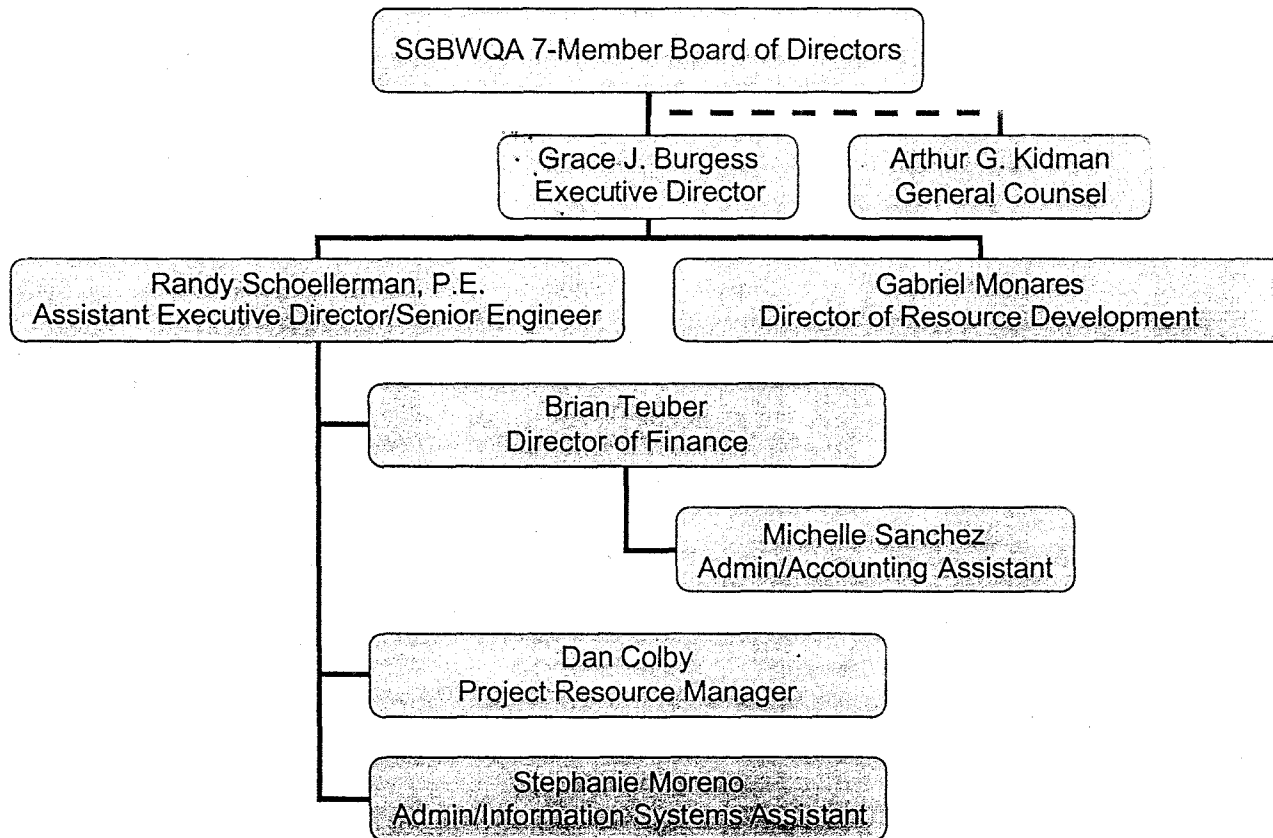
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APPENDIX B

San Gabriel Basin Water Quality Authority 2003 Organizational Chart

San Gabriel Basin Water Quality Authority

2003 Organizational Chart



APPENDIX C

**Federal Funding Program Administration
by the
San Gabriel Basin Water Quality Authority
Revised March 11, 2003**

**FEDERAL FUNDING
PROGRAM ADMINISTRATION**

**by the
San Gabriel Basin Water Quality Authority**

Originally Approved February 19, 2002

Revised March 11, 2003

SAN GABRIEL BASIN RESTORATION PROJECT
(Restoration Fund – up to 65% reimbursement for capital and O& M)
and
SAN GABRIEL BASIN DEMONSTRATION PROJECT
(Title XVI – up to 25% reimbursement for capital only)

Summary

The WQA, in furtherance of its goals and objectives, is now accepting proposals for reimbursement funds from the San Gabriel Basin "Restoration Fund" and Title XVI funds authorized by Congress. The following sections describe eligibility requirements, priority ranking criteria, and process for making application for either or both of these funds. Both programs require 100% of project funds deposited into WQA accounts prior to making each reimbursement request. Amounts shown will be allocated at the discretion of the WQA Board based upon available appropriations and local funding needs.

Schedule of Applications for Currently Available Funds:

Accept Applications	Restoration Fund	Title XVI	TOTAL
2/4/02 thru 4/1/02	\$15 million	\$5 million	\$20 million
5/6/02 thru 6/17/02	\$15 million	\$4 million	\$19 million
TOTAL AVAILABLE FUNDS	\$30 million	\$9 million	\$39 million

* Dates and/or amounts are subject to change

General Information

Restoration Funds

In late 2000, Congress passed the San Gabriel Basin Drinking Water Initiative authorizing the creation of the "Restoration Fund" and \$75 million for groundwater cleanup in the San

Gabriel Basin. Since that time, a total of \$30 million has been appropriated into the Restoration Fund for the San Gabriel Basin.

This program requires a 35% non-federal match deposited into the Restoration Fund to reimburse the project up to a maximum of 65% from federal sources. Funds from this program may be used for design, construction and operation & maintenance for up to 10 years following construction. The Restoration Fund is administered via the U.S. Bureau of Reclamation directly to the San Gabriel Basin Water Quality Authority for use within the San Gabriel Basin.

Congress acknowledged that millions of dollars have already been spent to remediate and protect groundwater contamination and prevent further contamination. Therefore, Congress allowed the use of those dollars to be credited towards the 35% non-federal matching requirement under this program. U.S. Bureau of Reclamation is responsible for approving all qualifying prior expenditures, however, WQA in its discretion will use this credit to eliminate the need to provide an additional 35% of the project costs to release the Restoration Funds.

Title XVI

In 1992, Congress authorized the San Gabriel Basin Demonstration Project to implement conjunctive use projects in the San Gabriel Basin. By implementing cleanup projects that provide a reliable source of water and reduce the need for outside sources of water, many of the basin's cleanup projects are eligible for this program.

This program requires a 75% match from non-federal sources to reimburse the project up to a maximum of 25% from federal sources. Funds from this program may be used for design and construction only. The Title XVI fund is administered via the U.S. Bureau of Reclamation directly to the San Gabriel Basin Water Quality Authority for use within the San Gabriel Basin.

Eligibility for WQA-Allocated Funds

Proposed project must meet all of the following conditions:

1. Project must be located within the jurisdictional boundaries of the WQA
2. Applicant(s) must demonstrate, through WQA's Procedure No. 38 process, that the project in the area of the proposed groundwater remediation project removes contamination, and protects and/or prevents groundwater contamination from spreading into clean areas
3. Applicant(s) must demonstrate that the project water will be put to beneficial use, with priority given to those projects which include an affected water purveyor and provides potable water, if applicable
4. Project must conform and further the objectives of the WQA §406 Plan or the intent thereof

5. Project must be consistent with the legislative intent of the statute(s) authorizing or appropriating the public funds used for project funding reimbursement
6. Project cannot have been used in calculating the 35% credit provision in the Restoration Funds.
7. Project cannot have begun operating prior to July 1, 1999 (this provision may be waived by the WQA Board through its "Fund Allocation Waiver" process attached as Exhibit "B")
8. Start of project construction for a new project must be anticipated within 18 months of executed agreement between WQA and applicant(s)
9. Applicant(s) must provide a plan that commits 100% of the required funds in WQA's account in advance of each payment owed on the project and prior to each reimbursement request.

Eligibility of WQA-Unallocated Funds

Unallocated funds will be allocated based upon the criteria and procedures contained within WQA's Procedure No. 38 (Exhibit A). Criteria for these projects shall be considered on a case-by-case basis based upon a staff recommendation to the WQA administrative/finance committee and the full board. Projects requesting funds will not be subject to the priority ranking criteria contained within this document.

Priority Ranking Criteria

WQA will use the following criteria to grant reimbursement from Restoration Funds and to determine the level of reimbursement. The answer to each question may be assigned points between 0 and 10 or 0 and 15, depending on the question. The higher scores represent a higher ranked priority position within each category for available funding. The highest possible points a project may be rated is 100 points with the lowest rating being 0. A bonus question is included to provide additional opportunity for a higher rating against the total 100 points possible.

CATEGORY	SCORING RANGE	TITLE XVI	RESTORATION FUNDS
Category 1	90-100	0 to 25%	up to 65% capital and/or O&M
Category 2	80-89	0 to 25%	up to 50% capital and/or O&M
Category 3	70-79	based upon availability	up to 40% capital and/or O&M
Category 4	0-69	based upon availability	up to 30% capital and/or O&M

1	Is applicant(s) ready to proceed with the groundwater remediation project?	0 = not fully ready to proceed 10 = yes, ready to proceed
2	Does the project complement U.S. EPA's plans? Is it consistent with U.S. EPA's plans and the NCP?	0 = does not complement plan and is not consistent 5 = complements and is consistent w/EPA plans 10 = complements and is consistent w/ EPA plans and NCP
3	How effective is project relative to amount of water treated and made available for use? Does the project use technology consistent with BAT?	0 = not effective relative to amount treated & available for use 5 = somewhat effective and consistent with BAT 10 = effective relative to amount treated & available for use, consistent with BAT
4	What are the impacts or potential impacts to the plume within the Main San Gabriel Basin?	0 = No 5 = Some impact 15 = Very significant impact
5	Is project a joint cleanup and water supply project?	0 = Not a joint cleanup and supply project 5 = Only a cleanup project 15 = Yes, project is a joint cleanup/supply project
6	Is project partially or solely funded by affected purveyor(s)?	0 = n/a 5 = yes, partially funded by purveyor(s) 10 = yes, solely funded by purveyor(s)
7	Does the project address immediate water supply needs in the MSG Basin?	0 = No 15 = Yes
8	Does the project address a need for migration control?	0 = No 15 = Yes
BONUS QUESTION	Is project partially or solely funded by PRPs through an executed agreement?	0 = no PRP agreement 5 = yes, partially funded by PRPs with an agreement 10 = yes, solely funded by PRPs with an agreement

Application Process – estimated process time is no less than 45 days

1. Applicant(s) may apply for Restoration or Title XVI Funds for a groundwater remediation project by submitting a written request to the WQA. Staff will review and analyze request and determine if all eligibility requirements are met. If eligible, staff will rank the project and evaluate possible funding from the Restoration Funds and/or Title XVI.
2. Staff will begin processing the application by initiating Phase I of WQA's Procedure No. 38, "WQA Project Participation" (Exhibit A). As part of Phase I, the full board will consider approval of the initial project concept and will make a preliminary determination on funding apportionment that will be the basis for developing a funding agreement for Phase II of Procedure No. 38.

WQA Authority

1. The WQA's jurisdiction includes the entire Main San Gabriel Basin as described in Section 201 of its enabling act. In 1984, the U.S. EPA designated several areas in the San Gabriel Valley Superfund Site as operable units also known as plumes. The WQA acknowledges and will take into consideration the EPA-designated plumes, their respective sizes, potential threats to water supplies and clean areas, costs, and levels of contamination.
2. The WQA will periodically publicly review the progress of any given project to ensure that maximum use of each year's Congressional appropriation for each program is achieved.
3. Contingent upon meeting the 35% non-federal matching requirement, funds may be reimbursed 100% by the USBR, therefore WQA may, at its discretion, apply the funds not allocated to reimburse projects in other areas of its budget. These may include costs related to projects owned and operated by the WQA (WQA Projects). However, funds applied to WQA Projects shall not exceed 65% of the total WQA costs incurred for all projects in any given budget year, collectively.

The WQA board shall apply the WQA unallocated reimbursement balance to other capital projects and/or O&M on projects within any operable unit, including subject project, possibly resulting in:

- a reduction in the following year's WQA assessment; and/or
- a rebate in proportionate amounts to all pumping rights holders in the Basin; and/or
- a credit in proportionate amounts to all pumping rights holders in the Basin at the time of the second assessment billing.

4. Project capital costs (estimated or actual) provided by each applicant(s) does not include costs for USBR administrative charges or project costs incurred directly by WQA (separate costs). Therefore, WQA shall reserve a projected amount to cover all these additional costs.

The following example demonstrates how the unallocated reimbursement funds may be allocated. Example is in present value terms.

EXAMPLE: Project "A" has been approved by WQA Board with a 50/50 cost share from Restoration Funds for capital and 10 years O&M. Applicant is required to fund 100% of expenditures. WQA approves use of existing USBR credit to meet 35% matching requirement, therefore applicant is not required to deposit additional 35% non-federal match into Restoration Funds.

\$10 million	Capital
<u>\$10 million</u>	O&M (\$1M/yr for 10 years)
\$20 million	Total Project Cost
<u>\$ 7 million</u>	Previous expenditure credit used to meet 35% non-federal matching requirement on behalf of the project
\$20 million	Deposited in WQA account by PRPs or water entity to pay 100% of project costs
<u>(\$20 million)</u>	Project Expenses Due and Payable
\$ 0	WQA account balance
<u>\$20 million</u>	Reimbursement to WQA by USBR (Restoration Fund)
\$20 million	WQA account balance
<u>(\$10 million)</u>	Reimbursement allocated to project
\$10 million	WQA unallocated reimbursement balance to applied to other capital and/or O&M projects within basin

EXHIBIT A

SAN GABRIEL BASIN WATER QUALITY AUTHORITY Policy and Procedures Manual

ADMINISTRATIVE PROCEDURES

No. 38

Date: 2/12/01

Revised:

WQA PROJECT PARTICIPATION

Purpose

WQA's focused role is primarily to facilitate projects and to seek and provide funds for remediation projects in the San Gabriel Valley. As a public agency, WQA is accountable to the general public. Therefore, the WQA shall apply a consistent process to provide opportunities for input by the public and to qualify projects for WQA participation. Criteria to which a proposed project shall be measured, but not required, are as follows:

- Project conforms and furthers the objectives of WQA's Section 406 Plan or the intent thereof
- Ranking on priority list if multiple requests are competing for available funds
- Requesting party to pay no less than 25% of capital costs
- Funding for operation and maintenance secured from funds other than WQA assessment
- Implementation of construction anticipated within one year of executed agreement

Phase I

A written request for WQA project participation by a Project Committee or any other entity shall be considered by the full board on a preliminary basis. Staff shall identify potential funding sources and shall identify all of the criteria the proposed project meets. If approved by a simple majority of the full board, staff will then allocate resources to implement Phase II. Staff shall begin the process of determining whether the project is a California Environmental Quality Act ("CEQA") Project and, if so, whether it is exempt from CEQA requirements.

Phase II

- WQA's staff engineer shall prepare a technical report for review by the WQA Engineering Committee.
 - The report shall analyze and review all pertinent documentation, including, but not limited to, WQA's Section 406 Plan, U.S. EPA's documents, Watermaster's Section 28 Application and documentation supporting project cost estimates provided by requesting party.
- WQA staff, in coordination with WQA legal counsel and the requesting party or project committee, shall develop a funding agreement for review by the WQA Administrative/Finance Committee.
 - As part of the development of the agreement, legal counsel shall identify project components which may not be legally recoverable under CERCLA or the WQA Act, or reimbursable from proposed funding source(s), if any. Staff shall provide oral communications to the committee regarding legal counsel's review. The agreement shall include the following minimum components:
 - A project description;
 - A statement of project cost
 - Internal overhead of all parties to the agreement may be included in the capital costs. Each party shall be responsible for determining the legally acceptable rate of their respective overhead and for the documentation and accounting thereof.
 - A maximum 10% contingency shall be considered a part of capital cost
 - WQA's costs for CEQA compliance will be considered capital costs, unless expressly excluded.
 - Definition of capital costs (i.e., overhead, legal costs, contingency, etc.)
 - A process for payment of invoices;
 - An agreement termination date;
 - Change order provisions shall require approval by the project committee or parties to the agreement;
 - Funding apportionments;
 - Project owner shall be responsible for compliance of all state environmental requirements, contract bidding, and any other regulations pertinent to the respective funding sources [i.e., CEQA,

competitive bidding, etc.]. WQA shall be responsible for the coordination of federal environmental requirements (NEPA) and will also assist the requesting party with any project-related required process to the extent needed, including serving as the lead agency for purposes of CEQA.

- Modification to the agreement shall require approval by parties to the agreement
- In conjunction with the preparation of the staff engineer report and funding agreement, if the project is not exempt from CEQA requirements, staff shall begin an initial study required by CEQA. All required CEQA documentation shall be completed before the implementation of Phase III.

Phase III

Approval for agreement execution by the Executive Director shall be provided by a simple majority of the full board.

- A written agenda submittal providing background and project summary shall be provided to the full board and shall include a draft funding agreement and the staff engineer report. The submittal shall certify that legal counsel has approved the draft agreement, unless a final review is required. In this case, staff may recommend approval contingent upon legal counsel's final approval. Any material changes shall require a subsequent approval by a simple majority of the board.

Phase IV

Project implementation shall require continuous WQA staff oversight.

- Project invoices, regardless of the presence of a project committee, shall be processed through WQA's internal, multi-level review process to provide redundant oversight.
- Bid documents shall be reviewed by WQA staff to ensure that the lowest responsible bidder is chosen. Engineer shall provide a report along with copies of the bids received.
- Progress reports shall be provided by WQA's staff engineer at Engineering Committee and full board meetings monthly.

EXHIBIT B

FORTHCOMING

APPENDIX D

**Litigation Strategies and Options
Trato, Coffino, Zeavin, & Bloomgarden LLP
March 1, 2000**

TATRO ■ COFFINO
ZEAVIN ■ BLOOMGARDEN LLP
ATTORNEYS

MEMORANDUM

To: Kirby Brill
Executive Director, San Gabriel Basin Water Quality Authority

From: Tatro Coffino Zeavin Bloomgarden LLP

Date: March 1, 2000

Re: Litigation Strategies And Options

As you requested, this memorandum, which is for public distribution, sets forth the legal bases for a demand and lawsuit by the San Gabriel Basin Water Quality Authority ("WQA") against responsible parties seeking cost recovery for expenditures by the WQA.

I. Claims Available to the WQA

The San Gabriel Basin Water Quality Authority Act, West Water Code Appendix, Ch. 134 (the "Act") explicitly authorizes, *inter alia*, claims for cost recovery against responsible parties under the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA").

II. The WQA's CERCLA Claim

This section discusses the elements that the WQA will have to prove to establish liability under CERCLA, as well as joint and several liability, attorneys' fees and defeating statutory defenses.

A. Establishing Liability: The Elements of a CERCLA Claim

CERCLA § 107(a) provides that any person who, among other things, owns or operates a facility from which there has been an actual or threatened release of a hazardous substance which causes the incurrence of response costs is liable for the "necessary costs of response" consistent with the National Contingency Plan ("NCP"). 42 U.S.C. § 9607(a). Liability similarly is imposed on parties who previously owned or operated a facility at the time such hazardous substance(s) were released. *Id.*

To establish that each potentially responsible party ("PRP") is liable under CERCLA, the WQA will have to establish each of the following elements of its CERCLA claim:

1. There has been a "release or a threatened release"
2. from a "facility" of a
3. "hazardous substance" that has
4. "caused" the incurrence of
5. "response costs" by the WQA
6. and the PRP is a "person" that, e.g., is the current owner and/or operator of the facility, or owned and/or operated the facility at the time of disposal of the hazardous substance(s) at the facility.

B. Allocation: Joint and Several Liability

Because the WQA is not itself a PRP under CERCLA, it can institute a cost recovery action under CERCLA § 107(a) – rather than a contribution action under CERCLA § 113 – and thereby seek to hold all of the PRPs at any given project jointly and severally liable for the WQA's necessary costs of response at that project consistent with the NCP.

A party that is not potentially responsible for response costs may sue PRPs for cost recovery under CERCLA § 107(a), and thereby hold the PRPs jointly and severally liable. See, e.g., United States v. Stringfellow, 661 F. Supp. 1053, 1060 (C.D. Cal. 1987).

C. Damages: Attorneys' Fees, Interest and Future Costs

1. Attorneys' Fees

The WQA should be permitted to recover its attorneys' fees incurred in prosecuting a cost recovery action under CERCLA. First, the Ninth Circuit in United States v. Chapman, 146 F.3d 1166 (9th Cir. 1998), held that the government is entitled to its attorneys' fees as response costs.

Second, the SGBWQA Act § 407(c) specifically authorizes the WQA to recover removal and remedial action costs, "including the costs of enforcement and litigation." Thus, recovery of the WQA's attorneys' fees explicitly is authorized under the Act.

2. Interest

The SARA amendments to CERCLA provide that "the amounts recoverable in an action under this section shall include interest on the amounts recoverable." CERCLA § 107(a)(4). In light of these amendments, courts have held that, absent unusual circumstances, prevailing parties in government enforcement actions as well as in private cost recovery actions may recover prejudgment interest.

The statute further provides that "interest shall accrue from the later of (i) the date payment of a specified amount is demanded in writing, or (ii) the date of the expenditure concerned." CERCLA § 107(a). Judicial interpretations of this provision vary. Regardless of what accrual date is applied, the WQA should be entitled to an award of some amount of pre-judgment interest.

3. Future Costs: Declaratory Relief

As explained above, CERCLA § 107(a) provides that responsible parties are liable for the past and ongoing response costs incurred as a result of the disposal of hazardous substances. CERCLA § 113(g)(2) also allows plaintiffs to seek from the Court a declaration that the PRPs are liable for the necessary response costs that will be incurred in the future in connection with the actual or threatened release of a hazardous substance.

D. Likely Defenses

CERCLA sets forth only three affirmative defenses to liability: the release and resulting damages were caused solely by (1) an act of God, (2) an act of war, or (3) an act of a third party other than an employee, agent, or party in contract with the defendant. CERCLA § 107(b). We do not anticipate that any of these statutory defenses will be available to any of the PRPs, but we do expect that any sued PRPs will defend litigation vigorously.

III. Prosecuting a Cost Recovery Action Under CERCLA

A. Research Before Filing Complaint

Before initiating litigation, the WQA must reasonably conclude that it will be able to establish each of the elements discussed in Section II.A., above, for each PRP named as a defendant in the complaint.

B. Filing Complaint and Prosecution of Action

After the information discussed above has been gathered for the project in question, a complaint can be prepared and filed in federal district court under CERCLA against each of the target PRPs as to whom we believe the WQA can establish liability. The WQA also may wish to consider, in particular cases, joining its claims with other plaintiffs (such as water purveyors) who also may have claims against the PRPs. Such joint prosecution may allow the WQA to realize a cost-savings by sharing its litigation costs and expenses with other named plaintiffs.

1. Obtaining Stipulations or Partial Judgments re Liability

It would be our goal to resolve the question of the PRPs' liability under CERCLA quickly after we have filed the complaint, and will seek to do so in one of two ways.

The first, and simplest, method is to request that the PRPs stipulate to liability. Because CERCLA affords so few defenses to liability, where the evidence is clear that liability will attach it is our experience that PRPs may agree to such a stipulation. This request can be made not long after the complaint is filed.

The second method for establishing liability – which can be undertaken if the parties will not agree to a stipulation – is to file a motion for summary judgment on the issue of liability. A plaintiff may file a motion for summary judgment as early as 20 days after commencement of the action. Fed. R. Civ. Proc. 56(a).

2. Trial and Timeline

Once liability has been established, the main issue remaining to be tried will be with respect to damages.

After all parties have been served with the complaint, if the PRP's are not amenable to stipulations re liability, we estimate that we will be in a position to serve motions for partial summary judgment with respect to liability thirty days thereafter. A hearing can be set twenty-four days after the motion is filed. Thus, we may be able to obtain liability determinations within ninety days of selecting the project(s) that will be addressed.

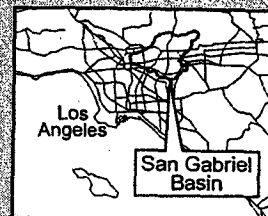
If, after liability determinations have been made, neither alternative dispute resolution nor a negotiated settlement is possible, we will attempt to get the case set for a trial on the remaining issues within twelve to fifteen months.

APPENDIX E

**San Gabriel Valley Superfund Sites / Baldwin Park Operable Unit
USEPA, Region 9
May 1999**



San Gabriel Valley Superfund Sites / Baldwin Park Operable Unit



U.S. Environmental Protection Agency • Region 9 • San Francisco, CA • May 1999

EPA Updates Cleanup Plan for the Azusa-Irwindale-Baldwin Park Area

Los Angeles County, California

The United States Environmental Protection Agency (EPA) is updating the Superfund cleanup plan for the Baldwin Park area of the San Gabriel Valley in response to the discovery, in 1997 and 1998, of several new pollutants in the groundwater. The EPA adopted the cleanup plan in 1994, after extensive public comment. The newly discovered chemicals include perchlorate, N-nitrosodimethylamine (NDMA), and 1,4-dioxane. Perchlorate is used in solid rocket fuel; NDMA has been found in liquid rocket fuel; and 1,4-dioxane has been used as a stabilizer in chlorinated solvents. Discharges of these chemicals to the ground are believed to have stopped many years ago, but a significant amount of contamination has reached the groundwater basin and requires cleanup. In addition to perchlorate, NDMA, and 1,4-dioxane, groundwater in the Baldwin Park area is contaminated with perchloroethylene (PCE), trichloroethene (TCE), and other chlorinated solvents. Chlorinated solvents are sometimes referred to as *volatile organic compounds* or VOCs.

The discovery of perchlorate, NDMA, and 1,4-dioxane will change the cleanup project, known as the Baldwin Park Operable Unit (OU), in three ways:

- 1) Additional treatment processes must be used to reduce perchlorate, NDMA, and 1,4-dioxane concentrations in the groundwater to safe levels. The technologies typically used to remove chlorinated solvents from water (air stripping and carbon adsorption) will not effectively remove perchlorate, NDMA, or 1,4-dioxane. Final decisions on treatment processes will be made during remedial design, later this year or early next year.
- 2) More of the treated groundwater is expected to be used locally, to replace

water supplies lost when perchlorate and NDMA forced local water companies to shut down some groundwater wells. Previously, local agencies were advocating the export of most of the treated groundwater to communities outside of the San Gabriel Valley.

- 3) Some of the groundwater extraction wells will be located further south than previously planned to prevent the spread of perchlorate and NDMA, as well as VOCs, to clean portions of the groundwater basin.

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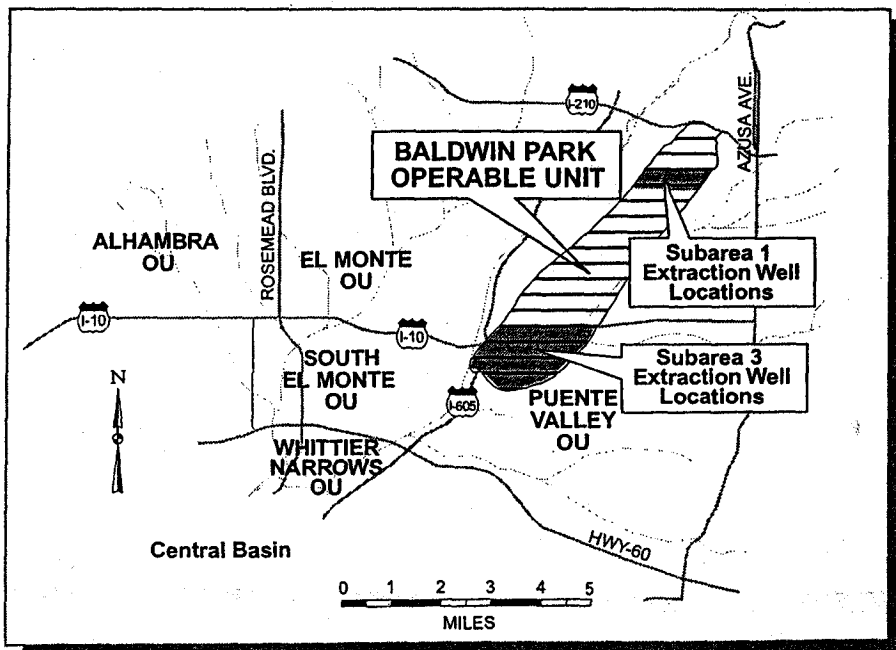


Figure 1: Location map of the Baldwin Park Operable Unit and other San Gabriel Valley Superfund Site Projects

These changes have delayed construction of the cleanup facilities by about two years while tests of perchlorate treatment technologies and changes to the groundwater extraction plan are completed. The treatment studies and updated extraction plan are almost complete. The changes will significantly increase the cost of cleanup, as described below.

If and when significant changes are needed in a Superfund cleanup plan, the EPA informs the community through an Explanation of Significant Differences. This fact sheet is intended to fulfill that requirement. We welcome comments on new aspects of the cleanup highlighted in this fact sheet and

on other issues raised by the discovery of perchlorate, NDMA, and 1,4-dioxane in the Baldwin Park area. We will, if appropriate, make additional changes in the cleanup plan in response to comments. EPA previously requested and considered comments on other aspects of the cleanup in 1993. The State of California, through its Department of Toxic Substances Control, supports the changes described in this fact sheet.

The remainder of the fact sheet provides a brief history of the Baldwin Park cleanup, summarizes the 1994 cleanup plan, and describes the changes to the 1994 plan in more detail.

The Baldwin Park Cleanup: A Brief History

1994: EPA Adopts Cleanup Plan

On March 31, 1994, the EPA adopted a cleanup plan for the Azusa-Irwindale-Baldwin Park area known as the *Baldwin Park Operable Unit Record of Decision*. The plan addresses a several-mile-long area of groundwater contamination in the San Gabriel Valley. The contamination results from the use and improper handling and disposal of carbon tetrachloride (CTC), PCE, TCE, and other chemicals. These chemicals were used in large quantities at industrial facilities in Azusa and surrounding areas as early as the 1940s, and by hundreds of businesses in the 1960s, 1970s and 1980s for degreasing, metal cleaning, and other purposes. The chemicals were probably released to the ground by a combination of onsite disposal, careless handling, leaking tanks and pipes, and other means.

The groundwater contamination was discovered in 1979. In 1984, the EPA added four portions of the San Gabriel Valley to the national Superfund list. The Baldwin Park area is officially known as the *San Gabriel Valley Area 2* Superfund site. Subsequent investigation by the EPA and others revealed the tremendous extent of groundwater contamination. During the past 15 years, more than one-quarter of the approximately 366 water supply wells in the San Gabriel Valley have been found to be contaminated. In response to the contamination, water companies have shut down contaminated wells, installed new treatment facilities, and taken other steps to ensure that they can continue to supply water meeting State and Federal drinking water standards.

The EPA's 1994 cleanup plan calls for the extraction and treatment of contaminated groundwater from two broad subareas of contamination. The northernmost of the two subareas is termed *Subarea 1*. Subarea 1 includes most of the known sources of the groundwater contamination, where contaminant concentrations in groundwater are hundreds of times drinking water standards. The southernmost subarea is termed *Subarea 3*, where contaminant concentrations are lower but still

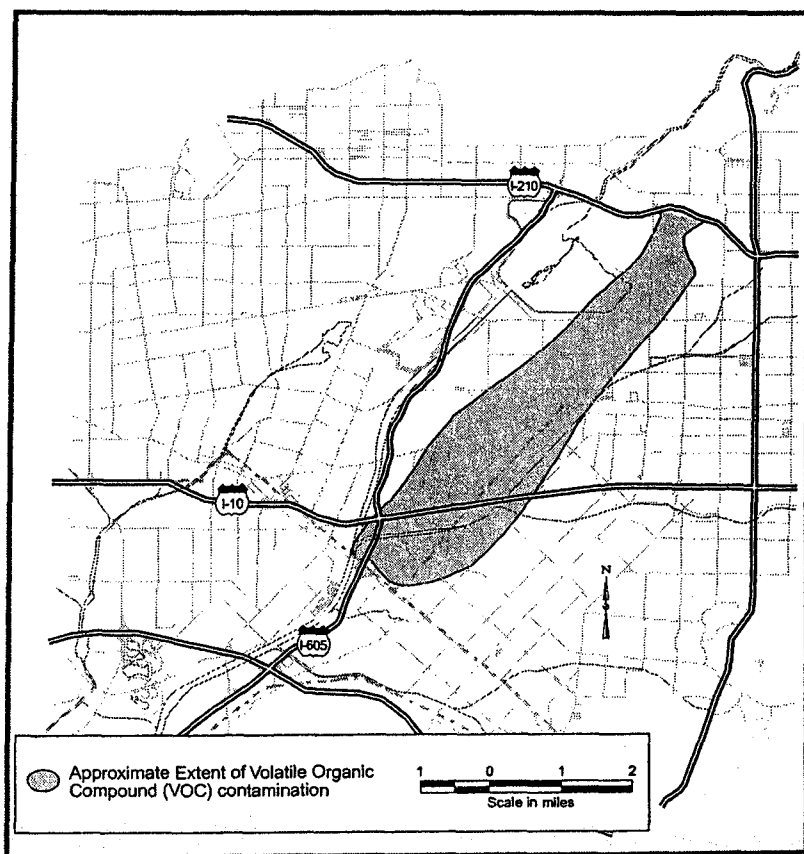


Figure 2: Approximate extent of VOC contamination in groundwater in the Azusa-Irwindale-Baldwin Park area.

exceed drinking water standards (see Figure 1).

The goals of the 1994 cleanup plan are to limit the movement of contaminated groundwater to clean or less contaminated areas and depths, remove a significant mass of contamination from the groundwater, and provide the data necessary to determine final clean up standards for the area. The plan calls for the construction and operation of groundwater extraction wells, treatment facilities, and conveyance facilities capable of pumping and treating approximately 19,000 gallons per minute of contaminated groundwater. The plan recommends the use of existing water supply wells, treatment systems, and pipelines to the extent possible, and the construction of new facilities where needed. Final decisions on extraction rates and locations were to be made during remedial design. In 1994, the EPA estimated the cost of the cleanup at \$47 million in capital costs and \$4 million/year for operation and maintenance. EPA's revised cost estimate is \$85 million in capital costs and \$10 million/year for operation and maintenance.

1995 - 1997: Potentially Responsible Parties (PRPs) Complete Pre-Design Work

In January 1995, the EPA began to name the companies responsible for the groundwater contamination. To date, the EPA has named 19 companies and property owners as Potentially Responsible Parties, also known as PRPs. In late 1995, a majority of these companies organized themselves into a group named the Baldwin Park Operable Unit Steering Committee. From 1995 to early 1997, the Steering Committee funded more than \$2 million of *pre-design* work needed as part of the cleanup. The Steering Committee installed and sampled a network of eight deep groundwater monitoring wells to improve our understanding of the extent of contamination and developed a detailed groundwater extraction plan. During this period, negotia-

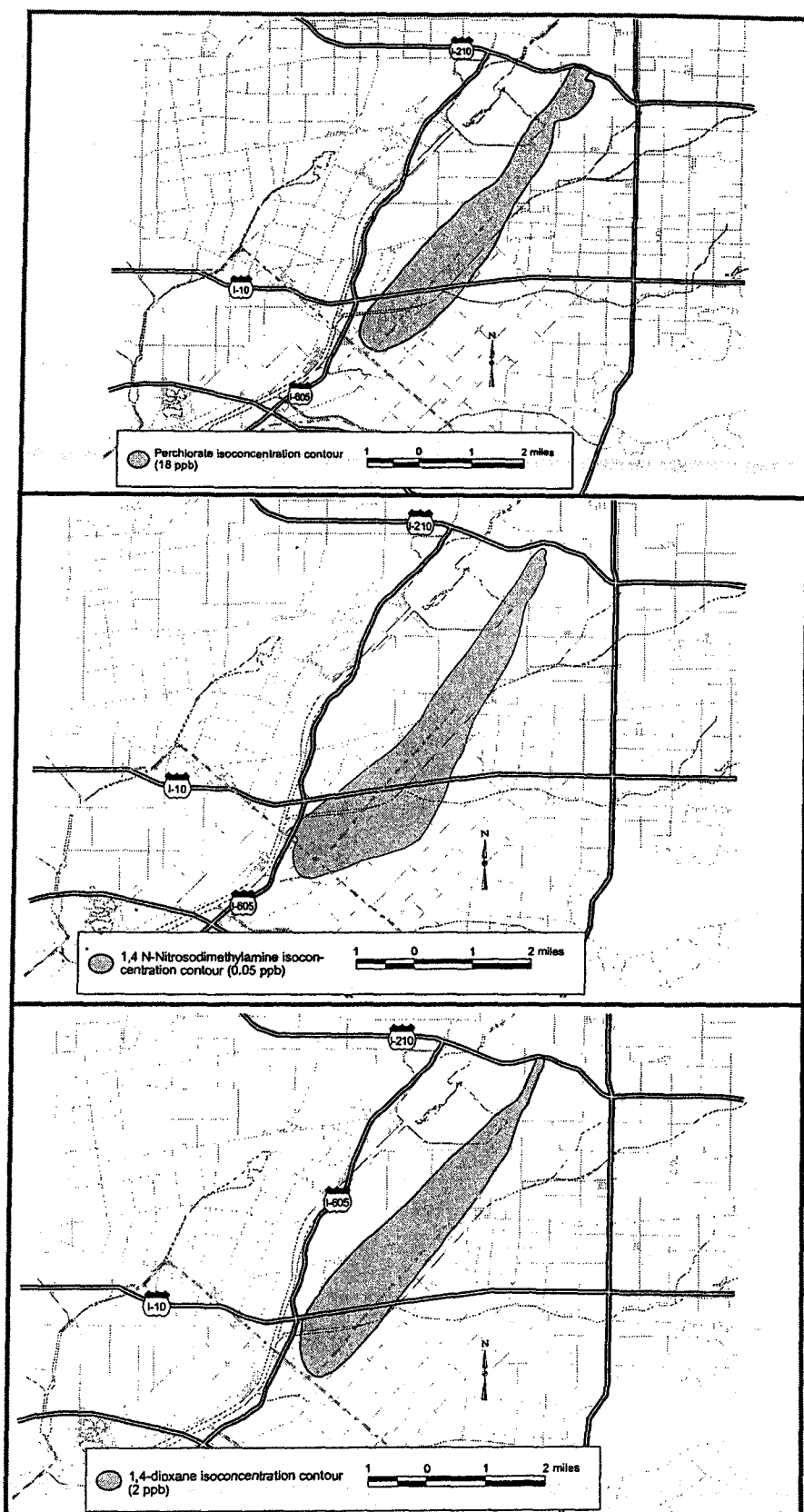


Figure 3: Approximate extent of perchlorate, NDMA and 1,4-dioxane contamination in groundwater

tions with water agencies continued, and a tentative water distribution and use plan was developed which called for delivery of the treated groundwater to the Metropolitan Water District of Southern California. The plan, labeled the *Consensus Plan*, called for export of the treated groundwater to areas now dependent on more expensive and less dependable imported water, in order to reduce the region's dependence on imported water supplies and raise revenue through sales of the treated water.

1997 - 1999: Discovery of Perchlorate Extends Negotiations and Triggers Need for Additional Pre-Design Work

In May 1997, the EPA sent *Special Notice* letters to 19 PRPs to begin formal EPA-PRP negotiations. The EPA's purpose in initiating the negotiations was to obtain a binding commitment from the PRPs to carry out the Baldwin Park cleanup plan (i.e., to design, construct, and operate the groundwater extraction, treatment, and delivery facilities). The negotiations were expected to conclude in late 1997, but the discovery in June 1997 of perchlorate at levels above 18 parts per billion (ppb) in groundwater forced an extension in the negotiations. At that time, no one knew the extent of perchlorate contamination in the Baldwin Park area and little was known about the cost, effectiveness, and reliability of possible treatment methods.

The discovery of perchlorate occurred soon after the California Department of Health Services developed an improved analytical method capable of detecting perchlorate at concentrations as low as 4 ppb in groundwater. The EPA had attempted to determine whether perchlorate was present in the groundwater in the mid 1980s, but the analytical methods available at the time were not capable of determining with certainty whether perchlorate was present. NDMA and 1,4-dioxane were discovered in the Baldwin Park area in 1998.

The highest concentrations of perchlorate, NDMA, and 1,4-dioxane are found in the groundwater in Azusa, in Subarea 1. Maximum concentrations of perchlorate and NDMA are more than 100 times the State drinking water action levels of 18 and 0.002 ppb respectively. The maximum concentration of 1,4-dioxane is more than 20 times the State drinking water action level of 3 ppb. Up to six miles downgradient of the industrial source area in Azusa, at the likely groundwater extraction locations in Subarea 3, perchlorate and NDMA concentrations remain above State action levels. The concentration of 1,4-dioxane in this area has, to date, been below the State action level. Figure 3 depicts the approximate extent of perchlorate, NDMA and 1,4-dioxane contamination in groundwater in the Baldwin Park OU.

In response to the discovery of perchlorate, the EPA extended its formal negotiations with the PRPs until July 1999. In exchange for the extension, the Steering Committee agreed to immediately proceed to complete additional pre-design work. The additional work included completion of a pilot-scale study of one perchlorate-removal technology (biological treatment); support for studies of a second perchlorate-removal technology (ion exchange); installation of four additional groundwater monitoring wells to help define the extent of perchlorate, NDMA, and 1,4-dioxane contamination; and revisions to the groundwater extraction plan. The ion exchange studies have been funded largely by the Main San Gabriel Basin Watermaster.

The treatment studies have successfully demonstrated that both technologies can remove perchlorate from groundwater down to non-detectable levels. Pilot-scale studies were not needed for NDMA or 1,4-dioxane removal, because experience at other sites has demonstrated that NDMA and 1,4-dioxane can be removed down to non-detectable levels using commercially-available treatment systems. See page 6 for a more detailed description of perchlorate, NDMA, and 1,4-dioxane treatment technologies. The additional treatment technologies needed to remove the new contaminants are responsible for most of the increase in the estimated cost of the cleanup.

At the same time that the treatment studies have been underway, the EPA, the PRPs, and local water agencies have continued efforts to determine the best use of the treated groundwater. Although no final decisions have been made, there has been a renewed interest in recent months in using the treated groundwater *within* the San Gabriel Basin, rather than exporting the water out of the Basin. This change in interest resulted in part because perchlorate and NDMA have forced water companies to shut down several water supply wells in the San Gabriel Basin, prompting water companies to look for additional supplies of clean water to replace the lost production. Ultimately, it is likely that much of the treated water will be used locally, but some may still be exported outside of the San Gabriel Basin. Since late 1998, discussions have been underway between the EPA, the PRPs, the Main San Gabriel Basin Watermaster, and affected water companies. The Watermaster and the affected water companies are interested in taking responsibility for building and operating some or all of the Baldwin Park cleanup facilities.

There are also multiple efforts underway to reduce the PRPs' share of the cleanup costs by securing other sources of funding. A Federal grant provided through the U. S. Bureau of Reclamation has paid for more than \$1 million in pre-design costs and is expected to provide additional money for

Table 1. Comparison of Cleanup Plans - Most Aspects of the 1994 Plan Have Not Changed

	ORIGINAL CLEANUP PLAN	UPDATED CLEANUP PLAN
Remedial Objectives	Limit further migration of contaminated groundwater, begin to remove contamination from the groundwater, and provide data necessary to determine final clean up standards	Same
Groundwater Extraction Areas	Extract groundwater from two broad areas of contamination (Subareas 1 and 3)	Same, except Subarea 3 is extended further south
Groundwater Extraction Rates	Extract contaminated groundwater at rates needed to meet remedial objectives. Determine final rates during remedial design. Initial estimate was 19,000 gpm	Same. Revised estimate is 20,000-21,000 gpm
Groundwater Treatment Technologies	Use air stripping, carbon treatment, and/or oxidation technologies to remove VOCs from the groundwater. Select technologies during remedial design	Use same technologies to remove VOCs. Also use ion exchange or biological treatment to remove perchlorate, UV light to remove NDMA, and UV oxidation to remove 1,4-dioxane. Select technologies during remedial design
Groundwater Treatment Standards	Design treatment systems to reduce contaminant concentrations to below MCLs	Reduce contaminant concentrations to below MCLs and reduce perchlorate, NDMA, and 1,4-dioxane concentrations to below State action levels
Use of Treated Groundwater	Supply to water companies for distribution, and/or recharge into the groundwater basin. Make final decision during remedial design	Same
Project Costs	Estimated capital costs of \$47 million; estimated operation and maintenance costs of \$4 million/year	Estimated capital costs increase to \$85 million; estimated operation and maintenance costs increase to \$10 million/year

design and construction costs (up to 25% of the project's capital costs). In March 1999, three of the San Gabriel Valley's U.S. Congressional Representatives cosponsored the San Gabriel Basin Drinking Water Initiative, which would, if it became law, provide up to \$75 million in additional Federal funding for groundwater cleanup in the Baldwin Park area and other contaminated areas in the San Gabriel Valley and an additional \$25 million for research on perchlorate treatment technologies.

The cleanup plan remains protective of human health and the environment and will continue to meet all applicable or relevant and appropriate requirements identified in the 1994 Record of Decision, as required by CERCLA Section 121(d).

Schedule

- **Spring 1999** - Design of treatment facilities at the La Puente Valley County Water District (LPVCWD) wellfield
- **Summer 1999** - Construction of treatment facilities at the LPVCWD wellfield
- **July 1999** - Deadline for Potentially Responsible Parties to submit a *Good Faith Offer* committing to design, construct, and operate the Baldwin Park cleanup facilities
- **Fall 1999** - Deadline for negotiation of Consent Decree
- **Late 1999-2001** - Design of remaining Baldwin Park cleanup facilities
- **2001-2003** - Construction of remaining Baldwin Park cleanup facilities

Treatment Options

Perchlorate

Since 1997, when perchlorate was discovered in the San Gabriel Valley groundwater basin, much progress has been made in developing treatment methods capable of removing perchlorate from the groundwater. Most of the attention has been directed at two technologies: biological treatment and ion exchange.

In the biological treatment process, microbes destroy perchlorate by converting the perchlorate ion to oxygen and chloride. Oxygen and chloride are present at low levels in all drinking water. Nutrients must be added to sustain the microbes. The Steering Committee has completed a six month pilot-scale study of an anaerobic biological process, demonstrating the reduction of perchlorate from approximately 75 ppb to below detectable levels. The same process is being used in a recently-constructed full-scale treatment system at the Aerojet Superfund Site in Northern California. A similar process has also been used at a Utah facility to treat non-potable wastewaters resulting from the manufacture and maintenance of rocket motors.

Biological treatment methods are capable of producing potable water, but additional testing must be completed to determine whether a biological process can reliably and cost-effectively remove perchlorate and produce drinking quality water. The necessary tests are planned for later this year, when a 300-500 gallon per minute biological treatment system should be in operation. The treatment system is expected to include a biological

reactor, followed by a biologically-active multimedia filter and granular activated carbon (GAC) *polishing treatment* (see Figure 4). The system will also include ultraviolet light treatment for removal of NDMA and VOCs. Biological treatment methods are new to many water utilities, but *biologically active* filters have been used in drinking water treatment

for decades to help remove particles and biodegradable organic matter.

The second of the two perchlorate-removal technologies receiving the most attention is ion exchange, in which the perchlorate ion is replaced by chloride, a chemically similar but non-toxic ion. Ion exchange processes have been used in homes and businesses for *softening* hard water for decades. Bench- and pilot-scale studies have demonstrated that ion exchange systems can reliably reduce perchlorate concentrations in San Gabriel Valley groundwater from approximately 75 ppb to below detectable levels. The studies have also provided valuable information on resin selection and regeneration, brine volume, and cost that will guide the design and operation of full scale systems. By summer 1999, a 2500 gallon per minute ion exchange system is expected to go online, producing potable water for use in the San Gabriel Valley.

The principal disadvantage of ion exchange systems is that they produce a concentrated brine that requires disposal and/or further treatment. Research is underway to try to identify methods of

reducing the volume of perchlorate-contaminated brines to reduce the high cost of disposal.

What are Perchlorate, NDMA, and 1,4-Dioxane?

Perchlorate is a highly soluble inorganic molecule made of chlorine and oxygen. Its chemical formula is ClO_4^- . In solid form, as ammonium perchlorate, it is highly explosive. At low concentrations in water, as is found in the San Gabriel groundwater basin, perchlorate is unreactive and persistent. Ammonium perchlorate and potassium perchlorate were used at two facilities in Azusa in the 1940s in the testing of solid fuel rockets and the manufacture of photoflares. Ammonium perchlorate is still in use today - in the solid fuel rockets that launch the space shuttle, in some missiles and fireworks, and other applications.

NDMA (N-nitrosodimethylamine) is a highly soluble organic chemical that was used, until about 1976, in the production of the liquid rocket fuel 1,1-dimethylhydrazine (also known as unsymmetrical dimethylhydrazine [UDMH]). NDMA has reportedly been present as an impurity in UDMH, and may be formed as a result of the chemical breakdown of UDMH. NDMA has been detected at trace levels in some manufactured products and foods, and can reportedly be produced as a byproduct of a number of chemical reactions. Its chemical structure is $(\text{CH}_3)_2\text{N}-\text{N}=\text{O}$. Hydrazine-containing fuels were used in Azusa as early as the 1940s.

The chemical *1,4-dioxane* is a highly soluble compound used as a stabilizer in chlorinated solvents, particularly 1,1,1-trichloroethane. Its chemical formula is $\text{C}_4\text{H}_8\text{O}_2$. It belongs to a class of organic compounds known as ethers. It is a different chemical than the similar-sounding dioxins. Chlorinated solvents likely to have contained 1,4-dioxane, including 1,1,1-trichloroethane, have been used in Azusa and Baldwin Park for many years.

An added benefit of both biological treatment and ion exchange processes is that they would also remove much of the nitrate from the water. The groundwater in some parts of the San Gabriel Valley is unusable because of high levels of nitrate. The nitrate is believed to result from past agricultural practices in the Valley.

Two other technologies have also been demonstrated to be capable of removing perchlorate from water, but probably at higher cost. Reverse osmosis and nanofiltration were tested by researchers at the Metropolitan Water District of Southern California and shown to be effective in removing perchlorate, but they are likely to be much more expensive to operate than ion exchange processes or biological treatment. Liquid phase granular activated carbon (GAC) also removes perchlorate, but only for a limited period of time before regeneration or replacement of the carbon is required. Frequent carbon replacement would make relying solely on GAC for perchlorate removal very expensive. Perchlorate cannot be removed from water by conventional filtration, sedimentation, or air stripping technologies.

NDMA and 1,4-Dioxane Treatment

NDMA can be removed from groundwater by ultraviolet (UV) light treatment. In a UV treatment system, the water passes through a tank containing high-intensity ultraviolet lamps. The NDMA molecules absorb the light energy and are broken down into smaller nontoxic molecules. The chemical 1,4-dioxane can also be removed by UV light treatment, in combination with an oxidant such as hydrogen per-

oxide. UV treatment systems have been successfully built and operated to remove both chemicals from water in locations throughout the United States.

Treatment Levels

The treatment technologies used at the Baldwin Park Operable Unit will have to be capable of effectively and reliably removing VOCs, perchlorate, NDMA, and 1,4-dioxane from the groundwater. If any of the treated groundwater is to be used as drinking water, the treatment technologies must reduce the concentrations of all contaminants to below Federal and State drinking water standards in existence at the time that the water is served. These standards, known as Maximum Contaminant Levels (MCLs), must be met at the tap. There are MCLs for some but not all of the chemicals present in the groundwater in the Baldwin Park area.

Safe levels for some chemicals that lack MCLs are specified by *action levels* developed by the California Department of Health Services (DHS). There are action levels for perchlorate (at 18 ppb); NDMA (at 0.002 ppb); and 1,4-dioxane (at 3 ppb). Although not an enforceable standard, an action level is the concentration of a contaminant in drinking water that DHS has determined, based on available scientific information, provides an adequate margin of safety to prevent potential risks to human health. California Health & Safety Code Section 116455 requires that the operator of a public water system notify local government authorities when a drinking water well exceeds an action level. In addition,

DHS recommends that drinking water systems provide public notification if action levels are exceeded, unless the wells in question are taken out of service. Public water systems virtually always shut down wells if action levels are exceeded.

Accordingly, in any water to be served as drinking water, the concentrations of perchlorate, NDMA, and 1,4-dioxane will be reduced to below action levels in existence at the time the water is served.

EPA's cleanup plan also allows some or all of the treated water to be recharged back into the groundwater basin instead of being delivered as drinking water. As discussed

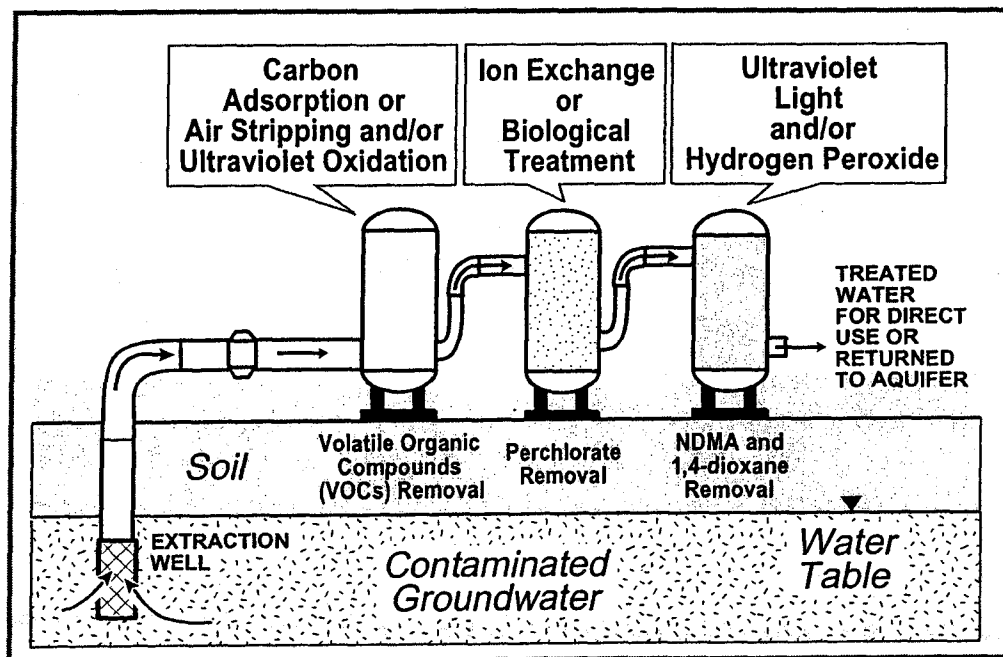


Figure 4: Groundwater treatment technologies

in greater detail in the Record of Decision, any water that is to be recharged must comply with the pertinent water quality objectives in the Los Angeles Regional Water Quality Control Board Basin Plan. In addition, State Water Resources Control Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," is applicable to any recharge of treated groundwater into the aquifer. Resolution No. 68-16 requires maintenance of existing State water quality unless it is demonstrated that a change will benefit the people of California, will not unreasonably affect present or potential uses, and will not result in water quality less than that prescribed by other State policies. In light of these requirements, any groundwater recharged into the aquifer will be treated to levels below action levels for perchlorate, NDMA, and 1,4-dioxane.

The treatment levels discussed above apply to the groundwater after it is pumped above ground. Neither the 1994 cleanup plan nor this update establish cleanup levels in situ (i.e., in the aquifer). EPA will propose in situ cleanup levels in a future action.

Final Selection of Treatment Technologies

The EPA believes that a final decision to select treatment technologies for the Baldwin Park Operable Unit should be deferred until later this year or early next year. That way, the results of continuing treatment studies in the San Gabriel Valley and elsewhere can be incorporated into the decision. By the end of 1999, it is likely that full scale ion exchange and biological treatment systems will be operating in the San Gabriel Valley, providing additional cost and performance data to guide the selection of treatment technologies.

EPA is issuing this Explanation of Significant Differences in part to satisfy its public participation responsibilities under CERCLA Section 117(c) and NCP Section 300.435(c)(2)(i).

Table 2. Status of the Five San Gabriel Valley Superfund Projects

U.S. EPA PROJECT	LOCATION	STATUS	UPCOMING ACTIONS
Baldwin Park Operable Unit (OU)	Portions of the cities of Azusa, Irwindale, Baldwin Park, and West Covina	Regional investigation completed; cleanup plan adopted; 19 PRPs identified; pre-design work completed.	See remainder of fact sheet for detailed update.
Whittier Narrows OU	In and adjacent to the Whittier Narrows Recreation Area	New cleanup plan proposed November 1998. No PRPs named.	Record of Decision expected by mid 1999. EPA-funded pre-design activities underway. Remedial Design to be completed in 2000.
Puente Valley OU	Portions of the cities of Industry and La Puente	More than 70 PRPs identified; regional investigation complete; cleanup plan adopted in September 1998.	EPA-PRP Consent Decree negotiations expected to begin in late 1999. Goal is to obtain a binding commitment from the PRPs to carry out the Puente Valley cleanup plan.
El Monte OU	Portions of the cities of El Monte and Temple City	20 PRPs identified; regional investigation completed; cleanup plan proposed in November 1998; seven early action monitoring wells installed	Record of Decision expected by June 1999. Formal EPA-PRP Consent Decree negotiations expected to begin later this year.
South El Monte OU	Portions of the cities of South El Monte, southern El Monte, and Rosemead	50 PRPs identified; regional investigation completed	Proposed cleanup plan expected by mid-1999.

Who's Who?

It's difficult to keep track of the many agencies and groups with a stake in the cleanup. Here is a quick summary of seven of the most active:

U.S. Environmental Protection Agency (EPA) - The EPA is ultimately responsible for cleanup of the groundwater contamination in the Basin, through the Superfund program. The Superfund program remains one of the most effective means of resolving the nation's historical contamination problems. The Federal law that established the program (known as CERCLA) includes a prohibition against lawsuits to delay or stop cleanup; stringent liability provisions to ensure that responsible parties pay; a trust fund of government money to be used if responsible parties fail to carry out their cleanup responsibilities; numerous opportunities for public involvement; and flexibility to tailor cleanup projects to reduce costs, meet local water supply goals, and satisfy other local needs.

Baldwin Park Operable Unit Steering Committee - The Steering Committee consists of a majority of the companies named as Potentially Responsible Parties. As of May 1999, 14 of the 19 companies named as PRPs were members of the Steering Committee. To date, the Steering Committee has spent more than \$3 million on investigation and treatment work needed for the cleanup.

Main San Gabriel Basin Watermaster - The Watermaster was created by a judgment of the California Superior Court to manage the San Gabriel groundwater basin under the jurisdiction of the Court. In 1991, the Watermaster's management responsibilities were expanded to further the cleanup and help preserve the basin's water resources. The Watermaster has been the primary sponsor of the ion exchange studies recently completed in the San Gabriel Valley, and is interested in taking responsibility for building and operating some or all of the Baldwin Park cleanup facilities.

San Gabriel Basin Water Quality Authority (WQA) - The WQA is a public agency created by State legislation to assist in the cleanup of the San Gabriel Basin. The WQA has offered a variety of ideas on how to carry out the Superfund cleanups in the San Gabriel Valley, and has funded construction of several interim cleanup projects in the Valley. The WQA has the authority to raise millions of dollars in funds through a tax on water production in the Valley.

The California Department of Toxic Substances Control (DTSC) - The DTSC is a State agency which has also funded wellhead treatment facilities in the San Gabriel Valley, and serves as the support agency for all of the San Gabriel Valley Superfund cleanups.

The California Regional Water Quality Control Board - The Regional Board is a State agency which has worked cooperatively with EPA to identify the sources of soil and groundwater contamination in the San Gabriel Valley.

The California Department of Health Services (DHS) - The DHS develops California MCLs and action levels, and regulates and monitors approximately 8500 public drinking water systems in California. DHS staff have participated in the recent testing of perchlorate treatment technologies in the San Gabriel Valley, and must approve any treatment systems used in the Baldwin Park cleanup to provide potable water.

For Copies of Documents

This document will become part of the Administrative Record file for the Baldwin Park Operable Unit. To examine or obtain copies of this document or other documents related to this project, contact:

EPA Region 9 Superfund Records Center
95 Hawthorne Street
San Francisco, CA 94105 • (415) 536-2000

The Record Center's hours are 8:00 am to 5:00 p.m., Monday through Friday. The Superfund Records Center can make documents available for viewing in San Francisco, photocopy and mail requested documents, or create and send you a CD-ROM containing requested documents. A subset of documents related to the Baldwin Park Operable Unit is also available at:

West Covina Public Library & Rosemead Library
1601 West Covina Parkway 8800 Valley Boulevard
West Covina, CA 91790 Rosemead, CA 91770
(626) 962-3541 (626) 573-5220

Call to check their hours. Documents available at all locations include:

Perchlorate Treatment Studies (prepared by Harding Lawson Associates for the Baldwin Park Operable Unit Steering Committee, unless noted otherwise)

- 09-29-1997 Draft Technology Screening for Treatability of Perchlorate in Groundwater, Baldwin Park OU
- 10-30-1998 Big Dalton Perchlorate Removal Pilot Study, prepared by Calgon Carbon Corporation for the Main San Gabriel Basin Watermaster (ion exchange)
- 02-12-1999 Final Phase 2 Treatability Study Workplan, Pilot Scale Groundwater Treatment System, Baldwin Park OU (biological treatment)
- 04-1999 Results of Bench-Scale and Pilot-Scale Studies of Ion Exchange for Perchlorate Removal, prepared by Montgomery Watson for the Main San Gabriel Basin Watermaster (ion exchange)
- 04-12-1999 Final Phase 1 Treatability Study Report, Perchlorate in Groundwater, Baldwin Park OU (biological treatment)

Groundwater Monitoring and Groundwater Extraction Plan (prepared by Harding Lawson Associates for the Baldwin Park Operable Unit Steering Committee, unless noted otherwise)

- 12-1996 Pre-Remedial Design Report..., Baldwin Park Operable Unit, prepared by Camp Dresser & McKee for the Baldwin Park Operable Unit Steering Committee
- 4-28-1998 Draft Phase 2A Well Installation and Groundwater Sampling Report..., Baldwin Park Operable Unit
- 1-21-1999 Draft Addendum to the Pre-Remedial Design Report, Baldwin Park Operable Unit

Information on Physical, Chemical, and Toxicological Properties of Perchlorate, NDMA, and 1,4-dioxane

- 7-1998 Action Level for N-NDMA (see DHS website: <http://www.dhs.ca.gov/ps/ddwem/chemicals/ndma/ndmaindex.htm>, updated 7/9/1998)
- 3-1999 Action Level for 1,4-dioxane (see DHS website: <http://www.dhs.ca.gov/ps/ddwem/chemicals/mcl/mclindex.htm>, updated 3/12/1999)
- 4-1999 Action Level for perchlorate (see DHS website: http://www.dhs.ca.gov/ps/ddwem/chemicals/perchl/perchl_standards.htm, updated 4/23/1999)

For more information about the EPA Superfund Program and EPA activities in the San Gabriel Valley, check

- EPA's national website: <http://www.epa.gov>
- EPA's Region 9 website: <http://www.epa.gov/region09>

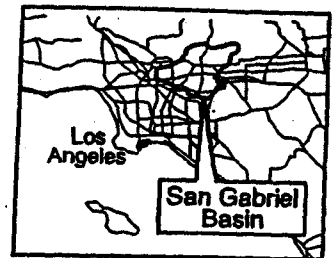


APPENDIX F

**San Gabriel Valley Superfund Site / South El Monte Operable Unit
Proposed Plan
USEPA, Region 9
September 1999**



San Gabriel Valley Superfund Site South El Monte Operable Unit Proposed Plan



U.S. ENVIRONMENTAL PROTECTION AGENCY • REGION 9 • SAN FRANCISCO, CA • SEPTEMBER 1999

EPA PROPOSES PLAN TO ADDRESS GROUNDWATER CONTAMINATION AT SOUTH EL MONTE OPERABLE UNIT

INTRODUCTION

The U.S. Environmental Protection Agency (EPA) is seeking public comments on this Proposed Plan for the South El Monte Operable Unit (OU) of the San Gabriel Valley Superfund Site in Los Angeles County, California. This Proposed Plan presents four alternatives, including EPA's preferred alternative, for addressing groundwater contamination at the South El Monte OU. EPA's objective for its preferred alternative is to protect human health and the environment. After evaluating the cleanup alternatives, EPA is proposing an interim cleanup plan to extract/treat,

contain, and monitor contaminated groundwater in intermediate zones at various locations within the western portion of the South El Monte OU to prevent further migration of existing groundwater contamination. In accordance with section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, EPA announces a Proposed Plan to solicit public input. EPA is required to provide 30 days for public comment on Proposed Plans. At the request of a member of the public, EPA is providing an additional 30 days for public comment on this Proposed Plan. EPA encourages you to review and comment on the

alternatives described in this Proposed Plan prior to the close of the public comment period on November 29, 1999. This Proposed Plan summarizes more detailed information found in the

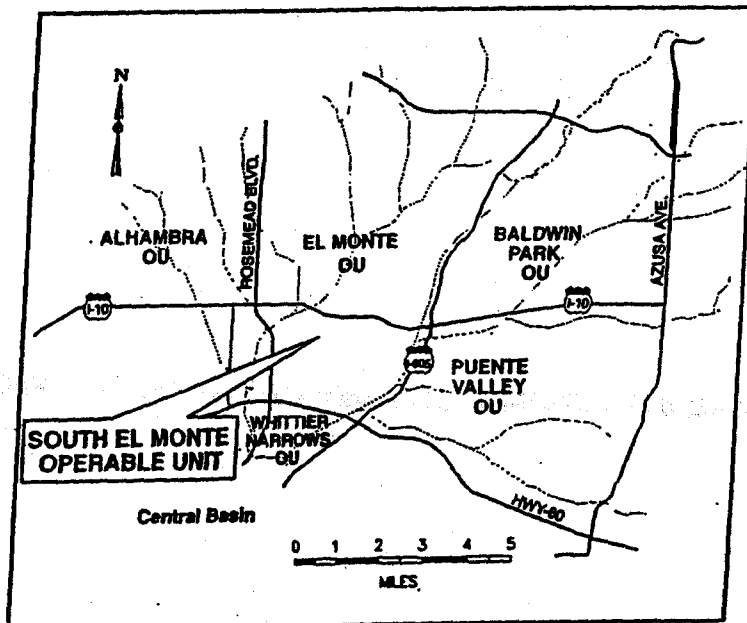


Figure 1: Location map of South El Monte Operable Unit

COMMUNITY MEETING

Proposed Plan Meeting for
the South El Monte Operable Unit

Wednesday, October 27, 1999
7:00 to 9:00 p.m.

South El Monte High School
1001 N. Durfee Avenue
South El Monte, CA
(626) 442-0218

(see map on back for directions)

At this meeting, EPA representatives will describe the alternatives evaluated and present EPA's preferred alternative. You will have the opportunity to ask questions, and give written and oral comments on all the alternatives described in the Proposed Plan and other site-related documents. EPA encourages you to comment on the Proposed Plan and other site-related documents during the public comment period (September 30 to November 29, 1999). Oral or written comments may be submitted at the community meeting. You may also submit comments by mail, fax or e-mail to:

Bella Dizon
Remedial Project Manager
U.S. EPA Region 9
75 Hawthorne Street (SFD-7-3)
San Francisco, CA 94105
Telephone: (415) 744-2155
Fax: (415) 744-2180
E-mail: Dizon.Bella@epa.gov

*Note: Comments sent by mail must be postmarked no later than November 29, 1999. Comments sent by phone, fax, or e-mail must be received no later than November 29, 1999.

Cont'd. on pg. 2

Remedial Investigation and Feasibility Study Reports and other documents in the Administrative Record for the South El Monte OU Interim Remedial Investigation/Feasibility Study. These documents are available for review at the information repositories listed on page 13.

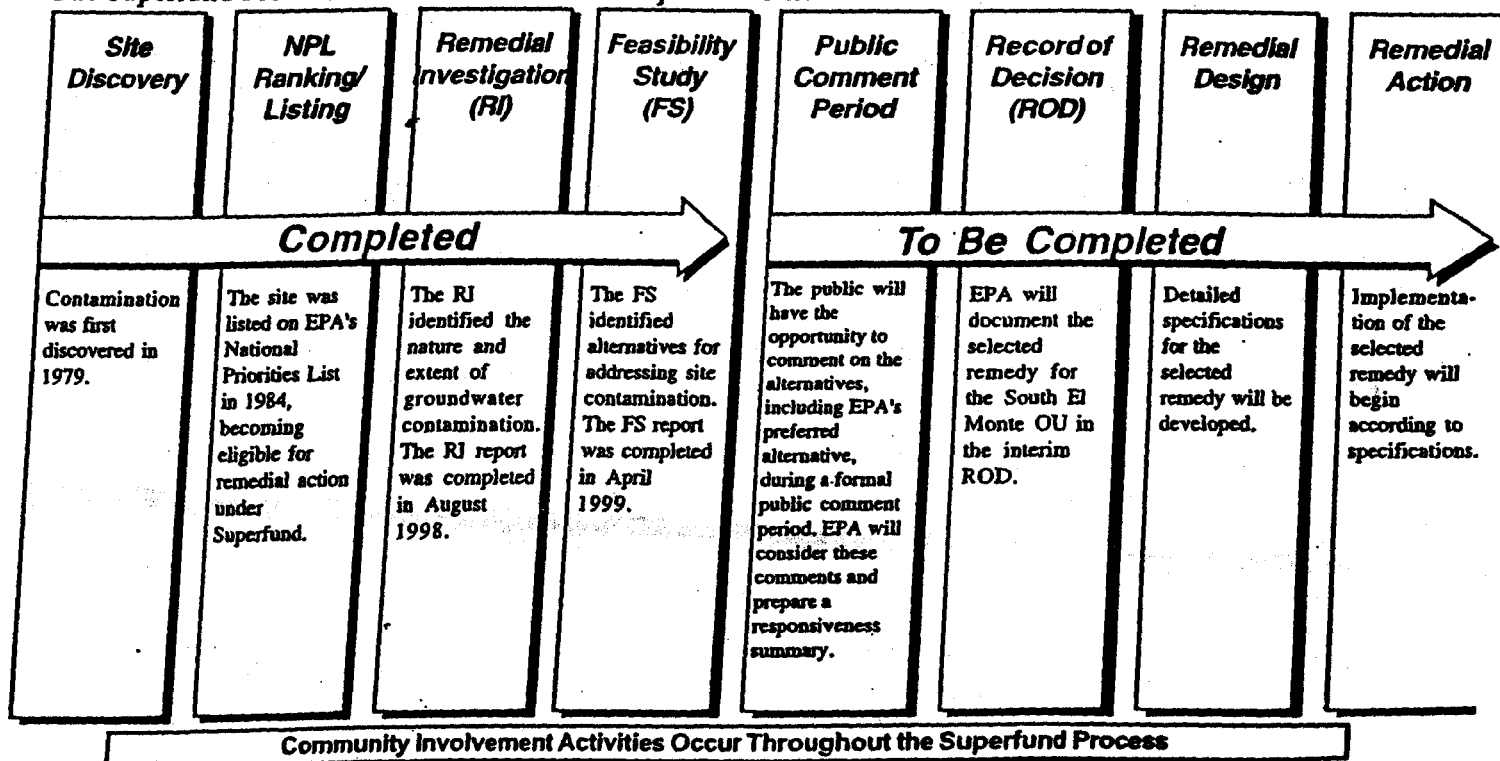
EPA encourages the public to review these documents to gain a more comprehensive understanding of the South El Monte OU and the associated Superfund activities. Public input on all alternatives, and on the information that supports the alternatives, is an important contribution to the remedy selection process. The public is encouraged to comment; your comments can influence EPA's decision. If warranted, the selected interim cleanup remedy could differ from EPA's preferred alternative because of either new information or public comments received by EPA.

A community meeting will be held on *Wednesday, October 27, 1999* to discuss the alternatives presented in this plan and to take your comments on the Proposed Plan (see box for details). In addition to presenting your comments at the public meeting, you may also comment in writing from *September 30 to November 29, 1999*.

As the lead agency for the South El Monte OU, EPA has worked with the Los Angeles Regional Water Quality Control Board (LARWQCB) and the California Department of Toxic Substances Control (DTSC) on this site. Both the LARWQCB and the DTSC have verbally concurred with EPA's preferred alternative. After considering public comments, EPA, in consultation with the DTSC and the LARWQCB, will select one of the alternatives presented in this Plan. EPA will then summarize the alternative selected in the interim Record of Decision (ROD) for the South El Monte OU.

A Responsiveness Summary, summarizing public comments and EPA's responses to comments will be included as a component of the ROD. After completion of the ROD in mid-2000, EPA intends to negotiate with potentially responsible parties for the South El Monte OU contamination to secure agreement for performance and funding for the selected alternative. Design and construction will begin after negotiations are completed. The Superfund process for the South El Monte OU is shown below.

The Superfund Process for the South El Monte Operable Unit



SITE BACKGROUND

The San Gabriel Basin aquifer provides approximately 90% of the domestic water supply for the Valley's residents. Forty-five different suppliers of water operate in the San Gabriel Basin and provide drinking water to more than one million people. Multiple areas of contaminated groundwater in the San Gabriel Basin aquifer prompted EPA to place four areas of the San Gabriel Valley on the National Priorities List (NPL) in 1984. The NPL identifies the highest priority hazardous waste sites in the United States for investigation and cleanup. The San Gabriel Valley Superfund Site includes areas of contamination which collectively cover approximately 30 square miles of the Valley's 170 square mile area. Groundwater contamination in the San Gabriel Valley is a result of decades of handling and disposal practices which released contaminants into the soil and groundwater. The primary contaminants in the groundwater are solvents called volatile organic compounds (VOCs). Typical VOCs include dry cleaning chemicals, paint thinners, and compounds used in metal plating and machinery degreasing.

The South El Monte OU is one of six active project areas, or operable units (OUs), in the San Gabriel Valley (Figure 1). The other active OUs in the San Gabriel Valley Superfund Site are the Alhambra OU, Baldwin Park OU, El Monte OU, Puente Valley OU, and Whittier Narrows OU.

In the late 1980s, the LARWQCB began investigating facilities that may have contributed to groundwater contamination in the South El Monte OU. In 1995, EPA reached agreement with some of the parties potentially responsible for groundwater contamination to perform investigation work to define the type and extent of groundwater contamination and evaluate potential cleanup alternatives. The investigation work is detailed in a document called the Remedial Investigation report, completed in August 1988. The evaluation of cleanup alternatives is detailed in the Feasibility Study report, completed earlier this year.

SITE CHARACTERISTICS

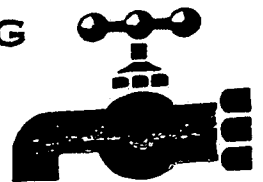
The South El Monte OU covers approximately eight square miles in the south central portion of the San Gabriel Basin. It is bounded by the San Bernardino Freeway (I-10) on the north, the Pomona Freeway (Highway 60) on the south, the San Gabriel River Freeway (I-605) on the east, and Walnut Grove Avenue on the west. Most of the South El Monte OU has been developed, except the large area of land within the Whittier Narrows flood control basin. The South El Monte OU includes the entire city of South El Monte and parts of the cities of El Monte and Rosemead. Most of the OU area is zoned for residential use, particularly the eastern and western portions, and is likely to remain residential. Industrial activity, primarily small to medium-sized businesses, occurs across the central portion of the South El Monte OU.

An underground feature in the South El Monte OU called a groundwater flow divide controls the direction that groundwater and contaminants in groundwater can move, and also affects the development and evaluation of cleanup alternatives for the OU. The flow divide generally occurs near Rush Street in the central portion of the OU (see Figures 2 and 3). Groundwater flow in the shallow zone (generally less than 100 feet below ground surface) is principally to the south and southwest towards Whittier Narrows. Groundwater flow in the intermediate zone

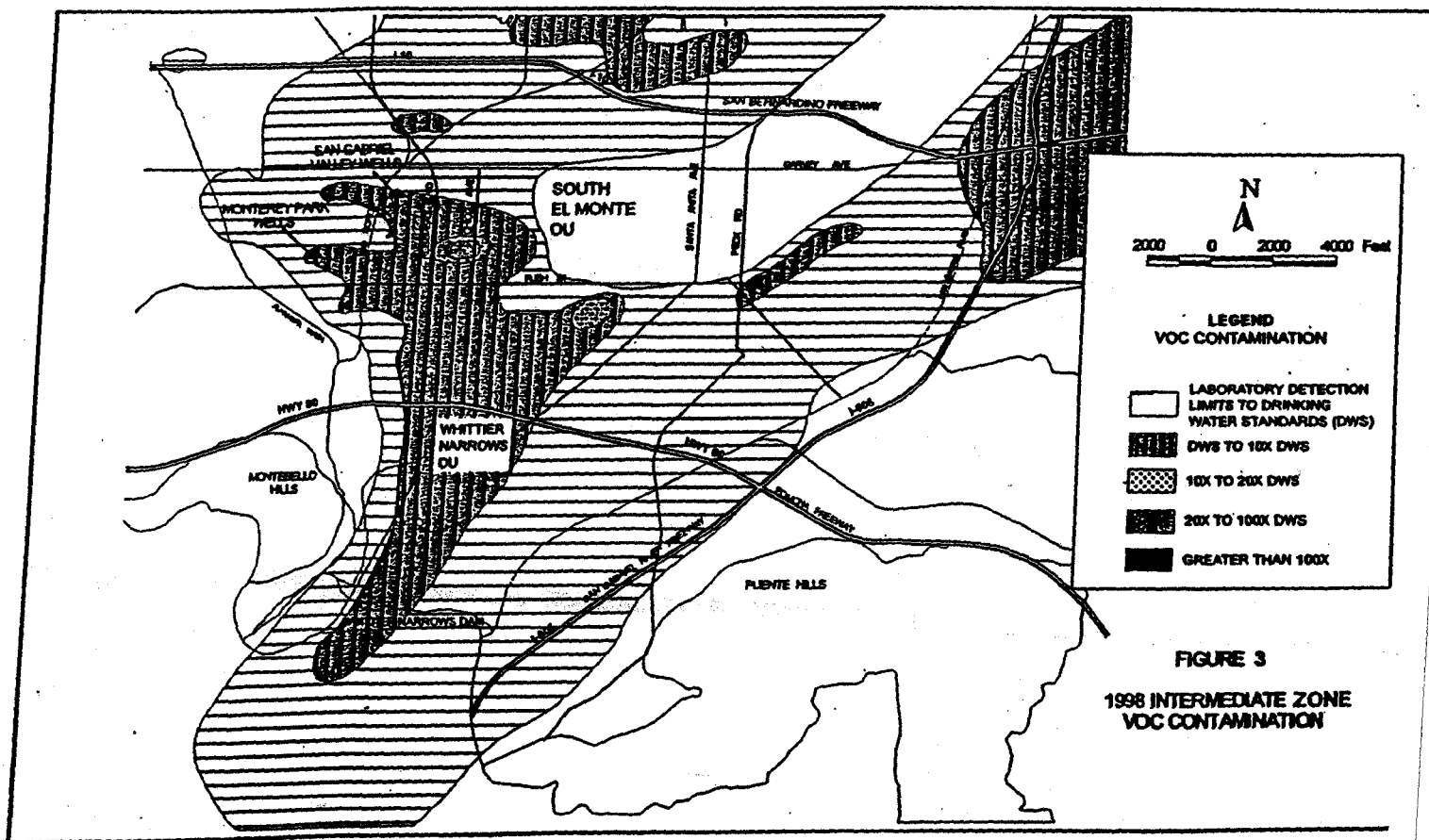
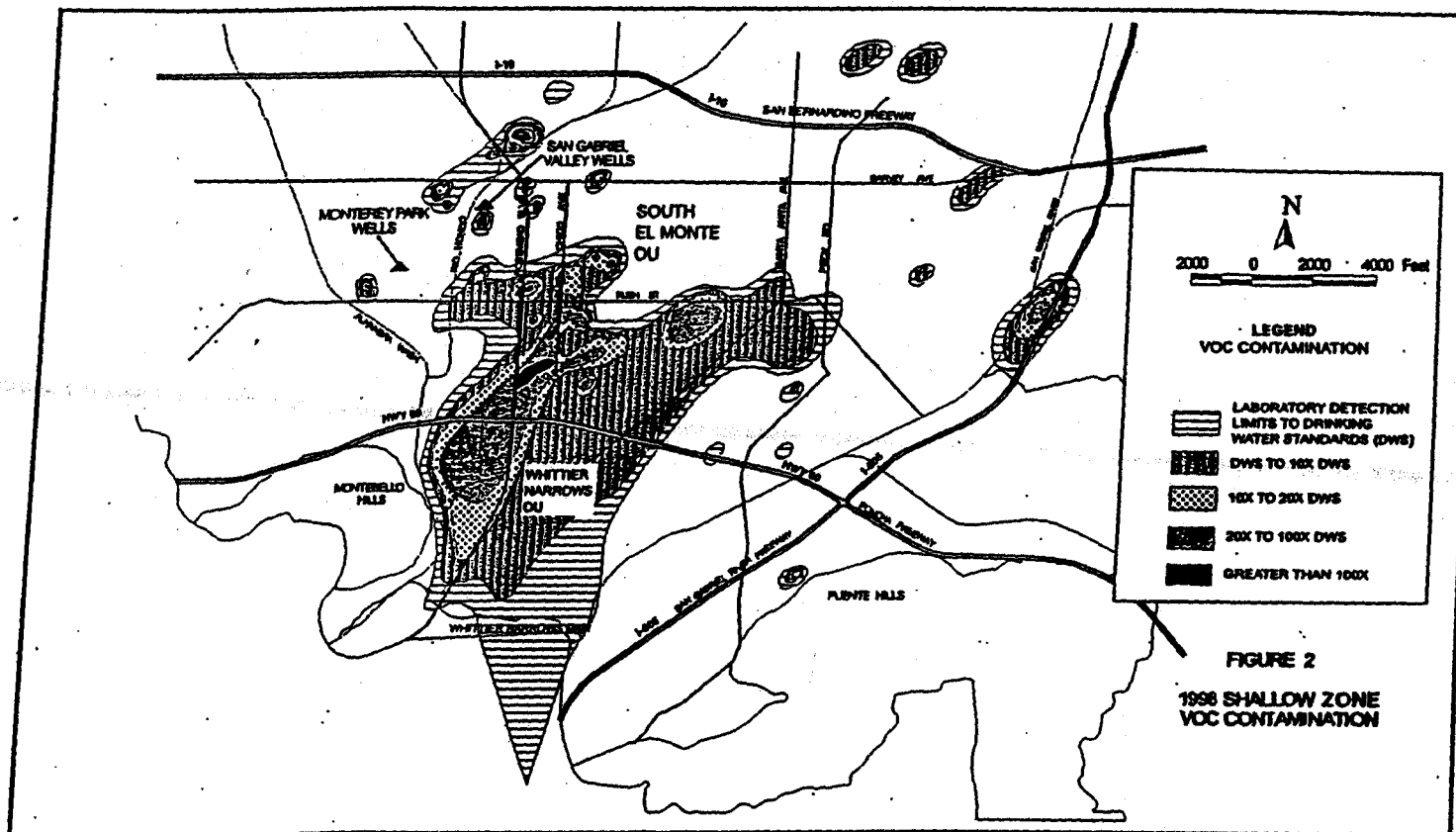
(generally between 100 and 400 feet below ground surface) north of Rush Street is towards the west and south of Rush Street the flow is south/southwest, towards Whittier Narrows.

VOCs are the primary contaminants found above state and federal drinking water standards (Maximum Contaminant Levels or MCLs) in South El Monte OU groundwater. The VOCs Tetrachloroethene (PCE) and Trichloroethene (TCE) are the primary contaminants of concern (COCs). PCE and TCE are the VOCs that are detected the most often and at the highest concentrations in groundwater, although other VOCs, including, 1,1-Dichloroethane, cis-1,2-Dichloroethene, and 1,1-

IS MY DRINKING WATER SAFE?



Yes! Although groundwater contamination has occurred, drinking water extracted from the South El Monte OU is treated by the water purveyors to meet all State and Federal drinking water standards. Currently, there are no drinking water supply wells that draw water from the shallow, highly contaminated zones.



Dichloroethene, have also been detected above drinking water standards in the South El Monte OU.

Sources of VOC contamination in the South El Monte OU include industrial facilities engaged in the manufacture of aerospace precision machines, aircraft fittings, pharmaceutical products and injectable drugs, chemicals, furniture, salsa, paint, jewelry, machine parts, cosmetic and dental composites, bathroom hardware, aluminum containers, precision sheet metals, electrical connectors, hand tools, and compressors; hazardous waste liquid storage and handling; drum reconditioning and recycling; petroleum storage and distribution; plastic molding; and battery recycling.

In general, VOC concentrations are highest in the shallow groundwater near industrial facility source areas where releases have occurred. However, EPA has not yet identified any specific "principal threat wastes," such as non-aqueous phase liquids (NAPLs) in the industrial source areas within the South El Monte OU. VOCs have also spread downward into the intermediate zone beneath the shallow zone, then migrated towards drinking water production wells located to the west and to the south in Whittier Narrows. Both of the impacted aquifer zones in the South El Monte OU (shallow and intermediate) are considered to be drinking water sources by the State of California and the intermediate zone is currently being used to supply drinking water. Several drinking water wells in the South El Monte OU have already been impacted by VOC contamination. These wells had to be shut down or equipped with wellhead treatment to reduce contaminant levels to drinking water standards.

In addition to the drinking water well impacts, contamination from the South El Monte OU has migrated south beyond the OU boundary (represented by Highway 60, the Pomona Freeway on Figures 2 and 3) into the Whittier Narrows OU, threatening drinking water sources in the Central Basin south of the San Gabriel Basin. The downgradient groundwater impacts have resulted in EPA taking action to control contaminant migration in the Whittier Narrows OU. EPA's actions in the Whittier Narrows OU will limit any further migration of contaminated groundwater into the Central Basin. Because EPA is already taking action in the downgradient Whittier Narrows OU, the Preferred Alternative for the South El Monte OU does not address the southerly migration of contamination in the shallow and intermediate zones. Figures 2 and 3 show VOC concentrations in shallow and intermediate groundwater as of 1998.

The LARWQCB, working under a Cooperative Agreement with EPA, oversees site-specific investigations at individual industrial facilities where releases have occurred. The LARWQCB has directed individual facilities in the South El Monte OU to clean up soil and shallow groundwater where elevated concentrations of contaminants were identified beneath the facility. These focused actions are intended to address the more highly-contaminated source areas, while EPA's actions address the widespread regional groundwater contamination.

SCOPE AND ROLE OF THE OU

EPA's Preferred Alternative for the South El Monte OU is classified as an interim action because it is intended to control the migration of contamination. Additional work may be needed to clean up VOC contamination remaining in the groundwater. One of the critical decisions EPA has to make is whether additional source control actions will be needed to address continuing sources of contamination that may remain even after implementation of this interim action. EPA will use information collected during operation of the interim action to help determine the need for additional actions in the South El Monte OU.

The OU-specific actions currently being undertaken by EPA throughout the San Gabriel Valley are primarily interim actions. It is anticipated that EPA will issue a final ROD for the entire San Gabriel Valley Superfund Site once remedial design/remedial action (RD/RA) implementation has been initiated at all of the individual OUs.

SUMMARY OF SITE RISKS

In 1997, EPA completed a baseline risk assessment for the South El Monte OU. A risk assessment uses information about the toxic properties of the chemicals at a site and the ways in which people might become exposed to those chemicals, to calculate how significant the health risk is, or would be, to someone who is or might be exposed to the chemicals at the site. Actual health risks only occur if people are exposed to the chemicals; if there is no exposure, there is no risk. The results of the risk assessment are one factor used by EPA to determine if actions are necessary to protect human health or the environment. EPA has also considered other factors, including contaminant concentrations above drinking water standards, to evaluate the need for interim actions. EPA's goal is to ensure that actual exposure to contaminated groundwater at unsafe levels does not occur in the future.

REMEDY SELECTION

Nine Criteria Analysis

1

Overall Protection of Human Health and the Environment

How risks are eliminated, reduced or controlled through treatment, engineering or institutional controls.



2

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Federal and state environmental statutes met and/or grounds for waiver provided.



3

Long-term Effectiveness

Maintain reliable protection of human health and the environment over time, once cleanup goals are met.



4



Reduction of Toxicity, Mobility or Volume (TMV) Through Treatment

Ability of a remedy to reduce the toxicity, mobility and volume of the hazardous contaminants present at the site.

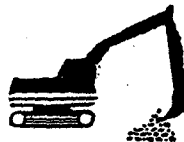
5

Short-term Effectiveness

Protection of human health and the environment during construction and implementation period.



6



Implementability

Technical and administrative feasibility of a remedy, including the availability of materials and services needed to carry it out.

7

Cost

Estimated capital, operation and maintenance costs of each alternative.



8



State Acceptance

State concurs with, opposes or has no comment on the preferred alternative.

9

Community Acceptance

Community concerns addressed; community preferences considered.



FINAL REMEDY

The State of California has defined all water under the site as a potential drinking water source. EPA's risk assessment evaluates what the risk *would be* if someone were to use the contaminated groundwater. For the South El Monte OU baseline risk assessment, EPA evaluated two scenarios in which individuals might be exposed to groundwater contaminated with VOCs in the absence of any cleanup actions or regulatory controls: potential *current* and *future* residential exposure through domestic use. The baseline risk assessment does not evaluate past exposures. A person could be exposed to contaminants by drinking the water, or by breathing certain contaminants that volatilize out of the water during activities such as showering, toilet flushing, and clothes washing.

EPA considered and assessed these potential risks by:

- 1) identifying chemicals present in the groundwater,
- 2) characterizing the population potentially exposed to these contaminants, and
- 3) evaluating the potential health effects resulting from exposure to the contaminated groundwater.

EPA uses protective assumptions and very high safety factors when performing these types of calculations, to ensure that public health is protected.

EPA considers two types of risks: cancer risk and non-cancer risk. Cancer risk is the excess chance of getting cancer due to a chemical exposure, over a period of 30 years of exposure. For example, a groundwater cancer risk of one in one million would mean there is one chance in a million that a person would get cancer *because* of exposure to the chemicals in the groundwater, if the person were exposed for 30 years. Risks greater than one in ten thousand generally require that action be taken at a site. The results of the South El Monte OU baseline risk assessment indicate that potential future residential exposure to the contaminated shallow groundwater through domestic use would result in total estimated lifetime cancer risks ranging from two in one hundred thousand to nine in ten thousand.

Non-cancer risk is measured by what is called a hazard index (HI). A HI at or below one (1) means that it is extremely unlikely for any non-cancer health effect to occur. A HI above one means that adverse effects could potentially occur, and the chance of occurrence will vary from small to large depending on the estimated HI value. Non-cancer risks greater than one generally require that action be taken at a site. The results of the South El Monte OU baseline risk assessment indicate that the estimated HI values for non-cancer effects generally ranged from 2-20, well above the threshold value of one.

The risks were estimated as the highest exposure that could reasonably be expected to occur. The elevated

potential future risks and exceedances of drinking water standards in South El Monte OU groundwater support EPA's decision to take action. Intermediate groundwater zone contamination exceeding drinking water standards has already impacted several production wells in the South El Monte OU.

EPA's evaluation of potential risks to ecological receptors indicates that there are no complete pathways for exposure to contaminated groundwater. Since there is no exposure, there is no risk and so no cleanup actions are warranted based on only ecological risk concerns in the South El Monte OU.

It is EPA's judgment that the alternative identified as EPA's Preferred Alternative in this Proposed Plan is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

The Remedial Action Objectives (RAOs) describe what the proposed site cleanup is expected to accomplish. EPA's RAOs for the South El Monte OU are to:

- Prevent exposure of the public to contaminated groundwater;
- Contain further migration of contaminated groundwater from more highly contaminated portions of the aquifer to less contaminated areas or depths;
- Reduce the impact of continued contaminant migration on downgradient water supply wells;
- Protect future uses of less contaminated and uncontaminated groundwater.

These objectives reflect EPA's expectation of restoring usable groundwater to its beneficial uses wherever practicable, within a time frame that is reasonable, or, if restoration is deemed impracticable, to prevent further migration of the plume, prevent exposure to the contaminated groundwater, and evaluate further risk reduction.

EPA has not established numeric, chemical-specific objectives for the contaminated portions of the aquifer or time frame for restoration because this is an interim action to contain contamination. Although this interim remedial action is focused on containing the contaminated groundwater, the proposed remedy will remove significant amounts of contaminants from the aquifer, in effect beginning the restoration process.

SUMMARY OF CLEANUP ALTERNATIVES

EPA considered several alternatives to control contaminant migration and reduce risks from potential exposure to the contaminated groundwater. These alternatives are evaluated against eight of the nine specific criteria established in the National Contingency Plan (see Page 6). These criteria include consideration of: overall protection of human health and the environment; ability to meet federal and state environmental laws and requirements; reduction of contaminant toxicity, mobility or volume through treatment; short-term effectiveness; long-term effectiveness; implementability; cost; and state acceptance. Evaluation of the community acceptance criterion will be based on comments received during the public comment period. Each alternative evaluated, including EPA's Preferred Alternative, is summarized in the following sections.

Alternatives 2, 3, and 4 include existing institutional controls that limit the potential for exposure to contaminated groundwater. These institutional controls include regulation of groundwater pumping and installation of new extraction wells in the San Gabriel Basin by the Main San Gabriel Basin Watermaster and California Department of Health Services (DHS) requirements that all water purveyors provide municipal and domestic water supply that meets Federal and State drinking water standards.

ALTERNATIVE 1 - NO ACTION

Present Worth Cost Estimate: \$0

EPA is required to consider a No Action alternative to serve as a basis for comparison with other remedial alternatives and to evaluate the risk to the public if no action were taken. In this alternative, no remedial actions are taken to control migration of contaminants from or within the South El Monte OU. This alternative does not include any groundwater monitoring, extraction, or treatment. There is no cost associated with this alternative and it would provide the least overall protection of human health and the environment. The No Action Alternative does not meet EPA's remedial action objectives and does not comply with state and federal requirements.

ALTERNATIVE 2 - GROUNDWATER MONITORING (NO ACTIVE RESPONSE)

Present Worth Cost Estimate:	\$1.54 Million
Capital Cost Estimate:	\$0.45 Million
Annual O&M Cost Estimate:	\$0.09 Million

The only remedial action specifically incorporated into this alternative is groundwater monitoring. No groundwater containment, extraction, treatment, conveyance, or discharge components would be implemented specifically for Alternative 2. This alternative does include implementing a monitoring program using new and existing wells to monitor compliance with the South El Monte OU remedial action objectives in the shallow and intermediate zones. Installation of three new multi-port monitoring wells (monitoring the shallow and intermediate zones) to supplement the existing monitoring well network is assumed for this alternative. Since this monitoring-only alternative does not prevent the continued migration of contamination, it does not meet the threshold requirements of protection of human health and the environment and compliance with state and federal requirements.

EPA'S PREFERRED ALTERNATIVE

ALTERNATIVE 3 - INTERMEDIATE ZONE CONTROL IN WESTERN SOUTH EL MONTE OU

	<u>Using new facilities</u>
Present Worth Cost Estimate:	\$9.09 Million
Capital Cost Estimate:	\$3.08 Million
Annual O&M Cost Estimate:	\$0.48 Million
	<u>Using existing facilities</u>
Present Worth Cost Estimate:	\$8.33 Million
Capital Cost Estimate:	\$2.32 Million
Annual O&M Cost Estimate:	\$0.48 Million

EPA's Preferred Alternative includes extraction, treatment, and monitoring of contaminated groundwater in the western intermediate zones in the South El Monte OU. This extraction will provide containment of contaminated water moving in the intermediate zone from the source areas in the central portion of the South El Monte OU towards groundwater pumping centers to the west. Drinking water wells completed in the intermediate zone in this area have already been impacted by VOC contamination above drinking water standards.

To develop cost estimates for the Feasibility Study, specific extraction and treatment systems were assumed for the western intermediate zone. These assumed systems include installation of primarily new facilities (wells, pipeline, etc.). The parties responsible for implementing the remedial action could use a different assemblage of extraction and treatment facilities to contain contamination as long as it meets EPA's remedial action objectives. This remedial action will incorporate a performance-based approach that provides for flexibility during implementation. Performance criteria will be used to ensure that the remedial action is meeting EPA's groundwater containment objectives for this remedial action. EPA proposes the following performance criteria for the intermediate zone:

The remedial action shall provide sufficient hydraulic control to prevent contaminated groundwater from migrating into or beyond the San Gabriel Valley Water Company and Monterey Park well fields in the western area of intermediate zone contamination (see Figure 3). The action shall address intermediate zone groundwater that is contaminated above drinking water standards with VOCs and other contaminants from industrial facilities.

Compliance with the intermediate zone performance criteria will be monitored at monitoring wells located sufficiently downgradient of contamination exceeding drinking water standards to ensure containment of contamination.

For the intermediate zone contamination, the preferred alternative provides the option of either installing new extraction wells, using the existing San Gabriel Valley Water Company and Monterey Park well field extraction systems, or using a combination of new and existing wells to provide the necessary containment. Use of existing water purveyor facilities will require an agreement between the parties implementing the remedy and the water purveyors. This agreement would need to address use of existing infrastructure and operational requirements to ensure that sufficient pumping occurs to provide the necessary containment, cost-sharing, and other operational issues.

Extracted groundwater will be treated for contaminants that exceed drinking water standards. VOCs that exceed drinking water standards will be treated by either air stripping with off-gas treatment or liquid-phase carbon adsorption. Other treatment technologies may be used if they meet the performance requirements and are evaluated in accordance with the nine criteria listed on page 6. For cost estimating purposes, the preferred alternative assumes a treatment system consisting of air stripping with carbon

adsorption of VOCs in the off-gas. If the necessary agreements can be reached, the treated water will be delivered to the two water purveyors with impacted wells in the area, San Gabriel Valley Water Company and the City of Monterey Park. If necessary, other discharge options, such as aquifer recharge or surface water discharge, will be evaluated. However, it should be noted that these alternative discharge options will likely have higher costs than utilizing local water purveyors. These cost differences are discussed further below.

The actual treatment technology and end use option will be selected during remedial design. Delaying selection of the final treatment technology to the design stage is in accordance with EPA's presumptive remedy guidance for groundwater remedies (*Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Groundwater at CERCLA Sites*, October 1996).

The preferred alternative includes a monitoring program that uses new and existing wells to monitor compliance with the South El Monte OU remedial action objectives in the shallow and intermediate groundwater zones. As part of the monitoring program, installation of two new multi-port monitoring wells is assumed to monitor remedy performance near the extraction wells.

The estimated cost for this alternative assumes extraction of approximately 5,800 gallons per minute (gpm) of groundwater from the intermediate zone. The estimated present worth cost for this alternative is \$9.09 million. This cost assumes land acquisition plus the installation and operation of two new extraction wells, two treatment facilities, and conveyance pipelines to the treatment facilities and from the treatment facility to the purveyor distribution systems. If the necessary agreements can be reached, the parties implementing the remedy may be able to use existing water purveyor facilities, including land, extraction wells, pumps, and pipelines. If this occurs, the capital costs (and the present worth cost) would drop by approximately \$0.76 million. The cost estimate also assumes that the water purveyors would offset some of the costs of the remedy by paying for the treated water they receive. For cost estimating purposes, the amount of purveyor reimbursement has been estimated at \$45 per acre-foot of water. If the necessary agreements cannot be reached to deliver treated water to the purveyors, the annual O&M costs would increase by at least \$45 per acre-foot or \$0.418 million (increasing the present worth cost estimate by \$5.2 million). The actual cost increases could be even higher, because some of the other discharge options, such as aquifer recharge, also require additional capital facilities.

After EPA and the potentially responsible parties have agreed on the implementation of the remedy, design and construction of this alternative would take 18 to 24 months. The RAOs would be achieved shortly after startup of the extraction wells, in conjunction with the Whittier Narrows OU remedy.

Although it is not a specific component of the South El Monte OU interim remedy, EPA's planned remedy in the adjacent downgradient Whittier Narrows OU will play an important role in containing South El Monte OU contamination and meeting the RAOs. As shown in Figures 2 and 3, South El Monte OU contamination extends beyond the South El Monte OU boundary (represented by Highway 60, the Pomona Freeway) and into the Whittier Narrows OU. EPA's Proposed Plan in the Whittier Narrows OU, issued for public comment in October 1998, calls for implementing a containment remedy near Whittier Narrows Dam to capture contaminated groundwater migrating through the Whittier Narrows OU. EPA plans to extract groundwater contaminated in excess of drinking water standards from both the shallow and intermediate zones near the Whittier Narrows Dam (shown in Figures 2 and 3). The extracted water will be treated and, if necessary agreements can be reached, provided to water purveyors for drinking water supply. After the Whittier Narrows OU ROD is signed, design and construction of the planned remedy would take approximately two years.

ALTERNATIVE 4 - INTERMEDIATE ZONE CONTROL IN WESTERN SOUTH EL MONTE OU AND SHALLOW ZONE SOURCE CONTROL

	<u>Using new facilities</u>
Present Worth Cost Estimate:	\$13.05 Million
Capital Cost Estimate:	\$3.49 Million
Annual O&M Cost Estimate:	\$0.77 Million

	<u>Using existing facilities</u>
Present Worth Cost Estimate:	\$12.29 Million
Capital Cost Estimate:	\$2.73 Million
Annual O&M Cost Estimate:	\$0.77 Million

This alternative includes all of the components of Alternative 3, plus a groundwater extraction and treatment system in the shallow zone source area in the South El Monte OU. Shallow extraction would occur at two exist-

ing shallow extraction wells northeast of Rosemead Boulevard/Pomona Freeway interchange. The additional extraction is intended to inhibit migration of high-level shallow zone contamination from the South El Monte OU into shallow and intermediate zones in the downgradient Whittier Narrows OU that are currently less contaminated.

Shallow containment would focus on the largest area of high-level shallow contamination in southern South El Monte (Figure 2). Although the intent of the extraction would be containment, the existing extraction wells are located in an area where they would also remove significant amounts of contaminants from the shallow aquifer. As in Alternative 3, the cost estimate assumes that the extracted water would be treated to remove VOCs using a common treatment technology such as carbon adsorption or air stripping with off-gas treatment. The assumed discharge option for the shallow extraction is groundwater recharge. The groundwater monitoring program for Alternative 4 includes the groundwater monitoring program assumed for Alternative 3, plus installation of two additional groundwater monitoring wells downgradient of the shallow extraction system.

Two sets of estimated costs for Alternative 4 are provided, depending on whether new facilities are used or existing water purveyor facilities are used. The description of EPA's preferred alternative, Alternative 3, provides additional detail on the differences between the two cost estimates and the types of agreements that would be required to use existing water purveyor facilities. After EPA and the potentially responsible parties have agreed on the implementation of the remedy, design and construction of this alternative would take 18 to 24 months. The RAOs would be achieved shortly after startup of the extraction wells, in conjunction with the WNOU remedy.

EVALUATION OF ALTERNATIVES

To select a remedy, EPA uses nine criteria (see Page 6) to evaluate the different remediation alternatives individually and against each other. The nine evaluation criteria fall into three groups:

- **Threshold criteria.** These are requirements that each alternative must meet to be eligible for selection and include overall protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs).

- *Primary balancing criteria.* These are used to weigh major trade-offs among alternatives and include long-term effectiveness; reduction in toxicity, mobility or volume through treatment; short-term effectiveness; implementability; and cost.
- *Modifying criteria.* These are considered after public comment is received on the Proposed Plan and taken into account in the final remedy selection process documented in the ROD. Modifying criteria include state acceptance and community acceptance.

Based on EPA's evaluation of the alternatives against eight of the nine criteria (see Table 1), EPA prefers Alternative 3. Alternatives 1 and 2 provide the least overall protection of human health and the environment and do not fully comply with State or Federal Requirements (ARARs). Because Alternatives 1 and 2 do not meet the threshold criteria, they can not be selected and are not discussed further. Considered in conjunction with the Whittier Narrows OU remedy, Alternatives 3 and 4 both satisfy EPA's remedial action objectives and satisfactorily meet the threshold criteria of overall protection of human health and the environment and compliance with State and Federal requirements. Alternatives 3 and 4 both address western intermediate zone contamination in the South El Monte OU. The intermediate zone contamination in the western portion of the South El Monte OU has impacted several production wells and EPA believes that controlling further contaminant migration in the intermediate zone is critical.

Alternative 4 is ranked slightly higher than Alternative 3 for the long-term effectiveness criterion because Alternative

4 provides supplemental shallow zone source control within the South El Monte OU. Because the Whittier Narrows OU remedy is providing containment at the downgradient boundary of contamination, the benefits of the additional shallow zone control in Alternative 4 are more for contaminant removal than migration control. Alternative 4 would provide much greater reduction in toxicity, mobility, and volume of contaminants through treatment than Alternative 3, although this increased contaminant removal increases costs substantially. Alternatives 3 and 4 are both expected to be implementable. Alternative 4 costs substantially more than Alternative 3. For this containment remedy, EPA does not believe that the additional contaminant removal benefits provided from the Alternative 4 shallow zone source control justify the additional cost. The Feasibility Study Report for the South El Monte OU provides a more detailed evaluation of the alternatives with respect to the eight criteria.

Based on information currently available, EPA believes the Preferred Alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria (State acceptance). EPA expects the Preferred Alternative to satisfy the statutory requirements in CERCLA Section 121(b): 1) be protective of human health and the environment; 2) comply with ARARs; 3) be cost effective; 4) utilize permanent solutions and alternative treatment technologies to the maximum extent practicable; and 5) satisfy the preference for treatment as a principal element. ■

Table 1: Comparison of Alternatives

ALTERNATIVE EVALUATION TABLE				
Evaluation Criteria	Alternative 1 No Action	Alternative 2 Groundwater Monitoring	EPA's Preferred Alternative Alternative 3 Intermediate Zone Control in Western South El Monte OU	Alternative 4 Intermediate Zone Control in Western South El Monte OU and Shallow Zone Source Control
Overall Protectiveness	○	○	●	●
Compliance with State and Federal Requirements	○	○	●	●
Long-term Effectiveness	○	◐	●	●
Implementability	not applicable	●	●	●
Short-term Effectiveness	not applicable	◐	●	●
Reduction of Toxicity, Mobility or Volume by Treatment	○	○	◐	●
Present Worth Cost	\$0	\$1.54 million	\$9.09 million	\$13.05 million
State Agency Acceptance	DTSC and the LARWQCB have verbally concurred with EPA's preferred alternative.			
Community Acceptance	Community acceptance of the preferred alternative will be evaluated after the public comment period.			

 = Fully meets criterion
  = Partially meets criterion
  = Does not meet criterion

Note: The capital costs of Alternatives 3 and 4 are based on using primarily new production wells and infrastructure. If agreements are reached to use existing water purveyor-owned production wells and infrastructure, the capital costs of Alternatives 3 and 4 could decrease by an estimated \$760,000. Annual O&M costs for Alternatives 3 and 4 are based on purveyors using treated water for which they contribute \$45/ac-ft to offset O&M costs. If purveyors do not use the treated water, annual O&M costs for Alternatives 3 and 4 will increase by at least an estimated \$418,000 (net present value of \$5.2 million over 30 years at 7%).

INFORMATION REPOSITORIES

Copies of the RI and FS Reports for the South El Monte Operable Unit Interim Remedial Investigation/Feasibility Study and other site-related technical documents for the South El Monte Operable Unit of the San Gabriel Valley Superfund Site are available for review at the locations listed below. These documents are part of the Administrative Record for the South El Monte Operable Unit.

U.S. EPA SUPERFUND RECORDS CENTER

95 Hawthorne Street, Suite 403S
San Francisco, CA 94105-3901
Telephone: (415) 536-2000; Fax: (415) 764-4963
Hours: Monday to Friday: 8:00 a.m. - 5:00 p.m.
Saturday & Sunday: Closed

WEST COVINA LIBRARY

1601 West Covina Parkway
West Covina, CA 91790
Telephone: (626) 962-3541
Hours: Monday to Wednesday 1:00 p.m. - 8:00 p.m.
Thursday to Saturday 10:00 a.m. - 5:00 p.m.
Sunday Closed

ROSEMEAD LIBRARY

8800 Valley Boulevard
Rosemead, CA 91770
Telephone: (626) 573-5220
Hours: Sunday & Monday Closed
Tuesday & Wednesday 12:00 p.m. - 8:00 p.m.
Thursday 10:00 a.m. - 6:00 p.m.
Friday 12:00 p.m. - 5:00 p.m.
Saturday 11:00 a.m. - 5:00 p.m.

FOR ADDITIONAL INFORMATION

For additional copies of this fact sheet or for other information on the Proposed Plan for the South El Monte OU of the San Gabriel Valley Superfund Site, please contact the following:

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U.S. EPA Region 9

75 Hawthorne Street (SFD-7-3)
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Catherine McCracken
Community Involvement Specialist
U.S. EPA Region 9

75 Hawthorne Street (SFD-3)
San Francisco, CA 94105
Telephone: (415) 744-2182 Fax: (415) 744-1796
email: Mccracken.Catherine@epa.gov

For legal questions, contact:
Gavin McCabe, Office of Regional Counsel
U.S. EPA Region 9

75 Hawthorne Street (ORC-3)
San Francisco, CA 94105
Telephone: (415) 744-1334 Fax: (415) 744-1041
email: McCabe.Gavin@epa.gov

For media inquiries, contact:
Randy Wittorp, Media Relations Office
U.S. EPA Region 9

75 Hawthorne Street (CGR-2)
San Francisco, CA 94105
Telephone: (415) 744-1589 Fax: (415) 744-1605
email: Wittorp.Randy@epa.gov

...or you may leave a message on
EPA's Office of Community Involvement
toll-free line at (800) 231-3075
and your call will be returned.

MAILING LIST COUPON

If you did not receive this fact sheet in the mail and would like to be included on the mailing list to receive future EPA mailings about the San Gabriel Valley Superfund Site, please fill out the coupon below and return to the address printed on the reverse side of this self-mailer. Please place a stamp as indicated, fold on the fold line, fasten with tape and drop into the mail.

Catherine McCracken, Community Involvement Specialist
U.S. Environmental Protection Agency Region 9
75 Hawthorne Street (SFD-3)
San Francisco, CA 94105



PLEASE PRINT ALL INFORMATION

NAME: _____

ADDRESS: _____

*PHONE: _____

*FAX: _____

*E-MAIL: _____

*ORGANIZATIONAL AFFILIATION: _____

(*Optional items) You may also provide the above information via e-mail to: mccracken.catherine@epa.gov, or via fax to (415) 744-1796.

I AM INTERESTED IN:

All San Gabriel OUs _____

El Monte OU _____

Puente Valley OU _____

Alhambra OU _____

Whittier Narrows OU _____

Baldwin Park OU _____

South El Monte OU _____

____ PLEASE REMOVE MY NAME FROM THE MAILING LIST.

14 Documentation of Significant Changes

The Proposed Plan for the South El Monte OU was released for public comment in September 1999. The Proposed Plan identified Alternative 3, Intermediate Zone Control in the Western South El Monte OU, as the Preferred Alternative for addressing groundwater contamination in the South El Monte OU. EPA received and reviewed a large number of written and verbal comments submitted during the public comment period. During this period, EPA was made aware of additional data on the extent of groundwater contamination in the intermediate zone in the western portion of the South El Monte OU. This data indicated that the intermediate zone groundwater contaminated in excess of MCLs had migrated further west than was depicted in the FS Report (Geosystem Consultants, 1999) and Proposed Plan. EPA confirmed the larger extent of intermediate zone contamination by installing and sampling two new multiport monitoring wells in the spring of 2000. Because of this migration, the western boundary of the South El Monte OU described as Walnut Grove Avenue in the Feasibility Study and Proposed Plan, has moved with the contamination to the vicinity of San Gabriel Boulevard.

Although the change in the extent of intermediate zone contamination does not require changes to the general structure of the preferred alternative, it does impact the locations and cost of the facilities that will be required to meet the RAOs. In the Proposed Plan, the preferred alternative only discussed the need for containment in the vicinity of the San Gabriel Valley Water Company (SGVWC) and Monterey Park well fields (referred to as the "Central Containment Area" in Section 11). The discovery of significant contamination downgradient of these locations required EPA to evaluate the potential need for additional downgradient containment to meet the migration control objectives of the remedy. To assess the magnitude and location of potential supplemental containment, EPA performed groundwater modeling simulations. The groundwater modeling results are described in a memorandum (EPA, 2000) and summarized below.

To develop a revised containment scenario, the extraction scenario simulated for Alternative No. 3 in the FS Report (Geosystem Consultants, 1999) was modified to include additional pumping further west (referred to as the "Western Containment Area" in Section 11) at the downgradient edge of the plume. In the modified containment scenario, consistent with the simulations performed for the FS, all of the extraction is provided by existing water purveyor wells. However, this containment could instead be provided by extraction from new wells located upgradient of the existing wells. The modified containment scenario simulation includes the following:

- Operation of existing production wells at close to maximum capacity on a continuous basis if they have wellhead treatment systems currently operating or if the water purveyors have plans to install well head treatment systems in the near future. These wells include Monterey Park's wells 5, 12 and 15; selected SGVWC Plant 8 (8B, 8C, and 8D) wells; and SCWC's San Gabriel 1 and 2 wells
- Operation of selected additional purveyor wells as necessary to meet peak demands or to maintain system pressures
- Sufficient extraction from existing production wells to match historic average annual production rates for each purveyor's system
- Operation of EPA's planned remedy in the Whittier Narrows OU.

The average extraction rates for each of the wells assumed to be operating as part of the modified Alternative No. 3 are summarized as follows:

• Monterey Park No. 5 well-	1,620 gpm
• Monterey Park No. 12 and 15 wells-	4,050 gpm
• SGVWC Plant 8 wells-	2,500 gpm
• SCWC San Gabriel 1 and 2 wells-	<u>1,850 gpm</u>
TOTAL-	10,020 gpm

It should be noted that the extraction rates simulated for the Monterey Park's No. 12 and 15 wells are higher than those used in the simulations for Alternative No. 3 performed for the South El Monte OU FS Report (Geosystem Consultants, 1999). Figure 5 shows the simulation results for the modified Alternative No. 3. The figure shows the simulated paths of groundwater particles within and around the interpreted area of VOC contamination in the intermediate zone of the South El Monte OU. The simulated particle tracks presented in Figure 5 confirm that the extraction wells included in the original Alternative No. 3 (i.e., Monterey Park Nos. 12 and 15; SGVWC's Plant 8 wells) provide containment of the upgradient (i.e., the "Central Area") intermediate zone contamination. These extraction wells would also capture some of the contamination that has migrated downgradient. The remainder of the contamination that has migrated further downgradient (the "Western Area") beyond the capture zone of these wells can be contained by extraction from the Monterey Park No. 5 and the Southern California Water Company (SCWC) San Gabriel Nos. 1 and 2 wells.

These simulation results show that containment can be achieved using extraction from existing wells. As noted above, containment could also be achieved by using new wells installed upgradient of the existing wells. Two of the existing well clusters included in the modified Alternative No. 3 simulations were not included in the original Alternative No. 3 presented in the Proposed Plan. These are the Monterey Park No. 5 and SCWC San Gabriel Nos. 1 and 2 wells. Because these wells are located downgradient of the primary containment provided by the upgradient Monterey Park/SGVWC wells, they may not need to be operated for as long to provide containment of this downgradient contamination.

The length of time that the additional containment systems would need to operate has been estimated using groundwater velocities derived from the simulation illustrated in Figure 5. The simulated groundwater velocities in the downgradient western area are about 400 feet/year and suggest that all of the groundwater would be captured by Monterey Park well No. 5 within about 6 years. Because retardation of contaminants such as PCE likely occurs in the intermediate zone, the estimated time to remove the contamination from the intermediate aquifer would be longer, approximately 10 years. This assumes a retardation factor of 1.8, as was used in the FS Report (Geosystem Consultants, 1999). Less time should be required to remove the contamination migrating towards the SCWC San Gabriel 1 and 2 wells because these wells capture a smaller area of contamination. Using the groundwater velocity and retardation factor described above, the estimated operational time frame for the SCWC wells is 5 years. These estimates are based on a number of assumptions; the actual amount of time needed to operate the containment systems in the Western Containment Area could be considerably different. However, the times cited above provide an adequate basis for estimating costs.

Revised Remedy Costs

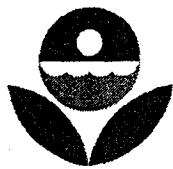
The estimated present worth cost of the modified Alternative No. 3, assuming use of all new facilities (i.e., none of the existing, water purveyor wells, pumps, land or other facilities would be used in the containment systems), is \$14.1 million (see Table 7). This cost estimate relies on all of the same cost assumptions and cost factors used in developing costs for Alternative No. 3 in the FS Report (Geosystem Consultants, 1999), and includes the costs of installing and operating additional facilities in the vicinity of Monterey Park No. 5 and SCWC San Gabriel Nos. 1 and 2. The cost estimate assumes that these facilities would need to operate for 10 and 5 years, respectively. The estimated present worth cost of the

modified Alternative No. 3 would be reduced to \$11.9 million if it is assumed that existing facilities are used (EPA 2000).

The actual amount of time that the supplemental containment systems for the Western Containment Area would need to operate is uncertain. Accordingly, the actual costs of the remedy could be higher or lower than those described above. For example, if both containment systems only needed to operate for 5 years, the estimated cost of the remedy would be \$13.7 million, rather than \$14.1 million. Conversely, if both wellhead treatment facilities had to operate for 15 years, the estimated cost of the remedy would increase to \$ 15.3 million (EPA 2000).

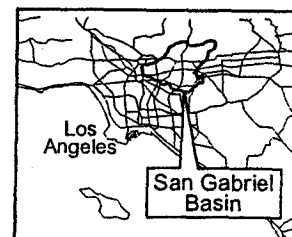
APPENDIX G

**San Gabriel Valley Groundwater Contamination Superfund Site / El Monte
Operable Unit
Proposed Plan
USEPA, Region 9
October 1998**



San Gabriel Valley Groundwater Contamination Superfund Site/El Monte Operable Unit Proposed Plan

U.S. Environmental Protection Agency • Region 9 • San Francisco, Ca • October 1998



EPA Proposes Plan to Address Groundwater Contamination at El Monte Operable Unit of the San Gabriel Valley Superfund Site

Introduction

The U. S. Environmental Protection Agency (EPA) is seeking public comments on this Proposed Plan for the El Monte Operable Unit (El Monte OU) of the San Gabriel Valley Superfund Site in Los Angeles County, California. This Proposed Plan presents five alternatives, including EPA's preferred alternative, for addressing groundwater contamination at the site. In accordance with section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, EPA announces a Proposed Plan

to solicit public review and comment. EPA traditionally provides 30 days for public comment on Proposed Plans. At the request of a member of the public, EPA is providing an additional 30 days for public comment on this Proposed Plan. EPA encourages you to review and comment on the alternatives described in this Proposed Plan prior to the close of the public comment period on December 26, 1998. This proposed plan summarizes the more detailed information found in the Remedial Investigation and Feasibility Study Reports and

other documents in the Administrative Record for the El Monte OU Interim Remedial Investigation/ Feasibility Study. These documents are available for review at the information repositories listed on page 11. EPA encourages the public to review these documents to

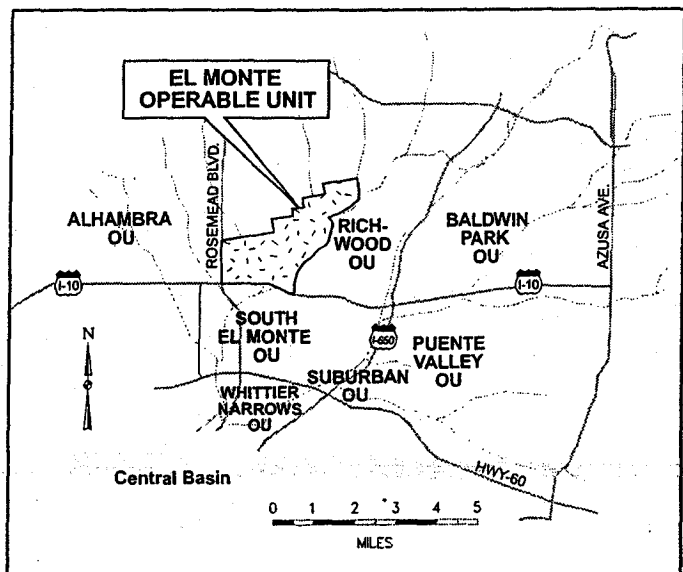


Figure 1: Location map of El Monte Operable Unit

COMMUNITY MEETING

Proposed Plan for the
El Monte Operable Unit of the
San Gabriel Valley Superfund Site

Wed., November 18, 1998
7:00 to 9:00 p.m.

South El Monte High School
1001 N. Durfee Avenue
South El Monte, CA
(626) 442-0218

(See map on back for directions)

At this meeting, EPA representatives will describe the alternatives evaluated and present EPA's preferred alternative. You will have the opportunity to ask questions, and give written and verbal comments on all the alternatives described in the Proposed Plan and other site-related documents. EPA encourages you to comment on the Proposed Plan and other site-related documents during the public comment period October 26 to December 26, 1998. Verbal or written comments may be submitted at the community meeting. You may also submit comments by mail, fax or e-mail to:

Bella Dizon
Remedial Project Manager
U.S. EPA Region 9
75 Hawthorne St. (SFD-7-3)
San Francisco, CA 94105
Telephone: (415) 744-2155
Fax: (415) 744-2180
E-mail: Dizon.Bella@epa.gov

*Note: Comments sent by mail must be postmarked no later than December 26, 1998. Comments sent by phone, fax, or e-mail must be received no later than December 26, 1998.

Cont'd. on pg. 2

gain a more comprehensive understanding of the El Monte OU and the associated Superfund activities.

A community meeting will be held on Wednesday, November 18, 1998 to discuss the alternatives presented in this plan and to take your comments on the Proposed Plan (see box for details). In addition to presenting your comments at the public meeting, you may also comment in writing during the public comment period from October 26 to December 26, 1998. EPA's objective for this preferred remedy is to protect human health and the environment.

After evaluating the cleanup alternatives, EPA is proposing to extract, treat, contain, and monitor contaminated groundwater in shallow and deep zones at various locations within the El Monte OU to prevent further migration of existing groundwater contamination.

As the lead agency for the El Monte OU, EPA has worked with the Los Angeles Regional Water Quality Control Board (LARWQCB) and the California Department of Toxic Substances Control (DTSC) on this site. Both the LARWQCB and the DTSC concur with EPA's preferred alternative. After the public comment period EPA, in

consultation with the DTSC and the LARWQCB, will select one of the alternatives presented in this Plan. EPA will then summarize the alternative selected in the interim Record of Decision (ROD) for the El Monte OU.

Public input on all alternatives, and on the information that supports the alternatives, is an important contribution to the remedy selection process. The public is encouraged to comment; your comments can influence EPA's decision. If warranted, the final cleanup remedy could differ from EPA's preferred alternative because of either new information or public comments that EPA receives.

EPA will complete the ROD in approximately six months. A Responsiveness Summary, summarizing public comments and EPA's responses to comments will be included as a component of the ROD. After completion of the ROD, EPA intends to negotiate with potentially responsible parties for the El Monte OU contamination to secure funding for the selected project. Design and construction will begin after negotiations are completed. The Superfund process for the El Monte OU is shown on page 7.

Site Background

The El Monte OU is part of the San Gabriel Valley Superfund Site, located in eastern Los Angeles County, California (Figure 1). The term "Operable Unit" (OU) is used to define a discrete action that is an incremental step toward a comprehensive site remedy. Operable units may address certain geographic areas, specific site problems, initial phases of a remedy, or a set of actions over time. In addition to the El Monte OU, EPA has identified other OUs at the San Gabriel Valley Superfund Site. These are the Baldwin Park OU, Alhambra OU, Puente Valley OU, Richwood OU, South El Monte OU, Suburban OU, and Whittier Narrows OU.

The San Gabriel Valley encompasses a basin that is approximately 170 square miles. Groundwater in the San Gabriel basin is the primary drinking water source for more than one million people. Regional groundwater contamination by volatile organic compounds (VOCs) prompted EPA to place the San Gabriel Valley on the National Priorities List (NPL) in 1984. This list identifies the highest priority hazardous waste sites in the United States for investigation and cleanup.

The El Monte OU covers approximately 10 square miles in the south central portion of the San Gabriel Basin. The El Monte OU is generally bounded by the San Bernardino Freeway (Interstate 10) on the south, Rosemead Boulevard on the west, and Santa Anita Avenue and the Rio Hondo on the east. The El Monte OU is highly developed and lies within the cities of El Monte, Rosemead, and Temple City. Most of the area is zoned for residential use and is likely to remain residential. Industrial activity in the El Monte OU is primarily concentrated in the central portion of the OU.

Groundwater flow in the El Monte OU is principally from east to west. However, there is also a southerly component of groundwater flow in the eastern portion of the OU. Both of the aquifer zones (shallow and deep) in the El Monte OU are considered to be drinking water sources by the State of California and the deep zone is currently used for drinking water. VOCs are the primary organic contaminants found above state and federal drinking water standards (Maximum Contaminant Levels or MCLs) in the El Monte OU. Tetrachloroethene (PCE) and Trichloroethene (TCE) are the VOCs that have been detected most often in groundwater, although other VOCs, including 1,2-Dichloroethane, 1,1-Dichloroethene, cis-1,2-Dichloroethene, and 1,1-Dichloroethene, have also been detected above drinking water standards in the El Monte OU. In general, VOC concentrations are highest in the shallow groundwater in the vicinity of industrial facility source areas where releases have occurred. VOCs have also spread downward into the deep zone beneath the shallow zone, then migrated downgradient in the deep zone towards drinking water production wells. Several drinking water wells in the El Monte OU have been impacted by VOC contamination. These wells have had to be shut down or equipped with wellhead treatment to reduce contaminant levels. To address the industrial areas that contain the sources of groundwater contamination, the LARWQCB, with funding from EPA, oversees site-specific investigations and cleanups at facilities where releases have occurred. Figures 2 and 3 show 1997 VOC concentrations in the shallow and deep zones.

Figure 2: 1997 Shallow VOC Contamination

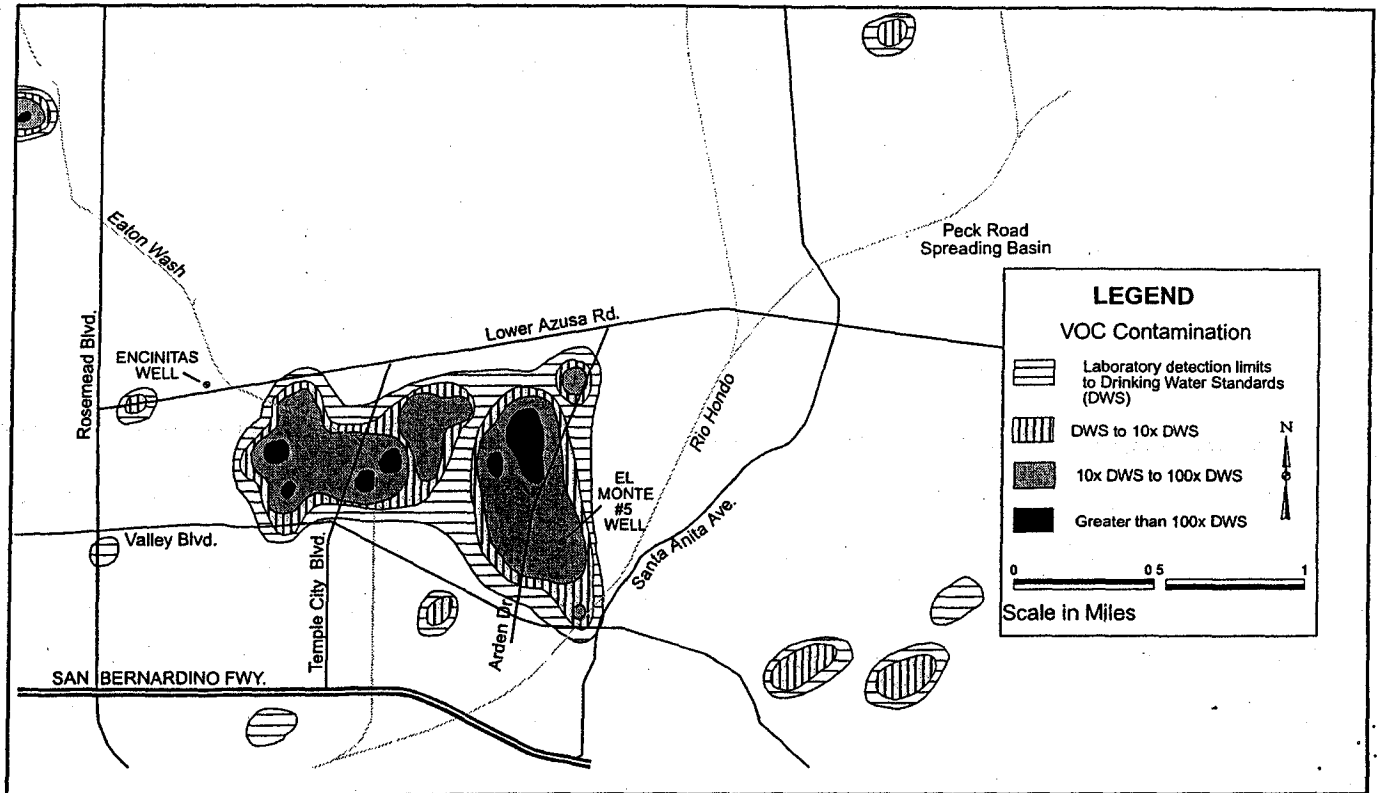
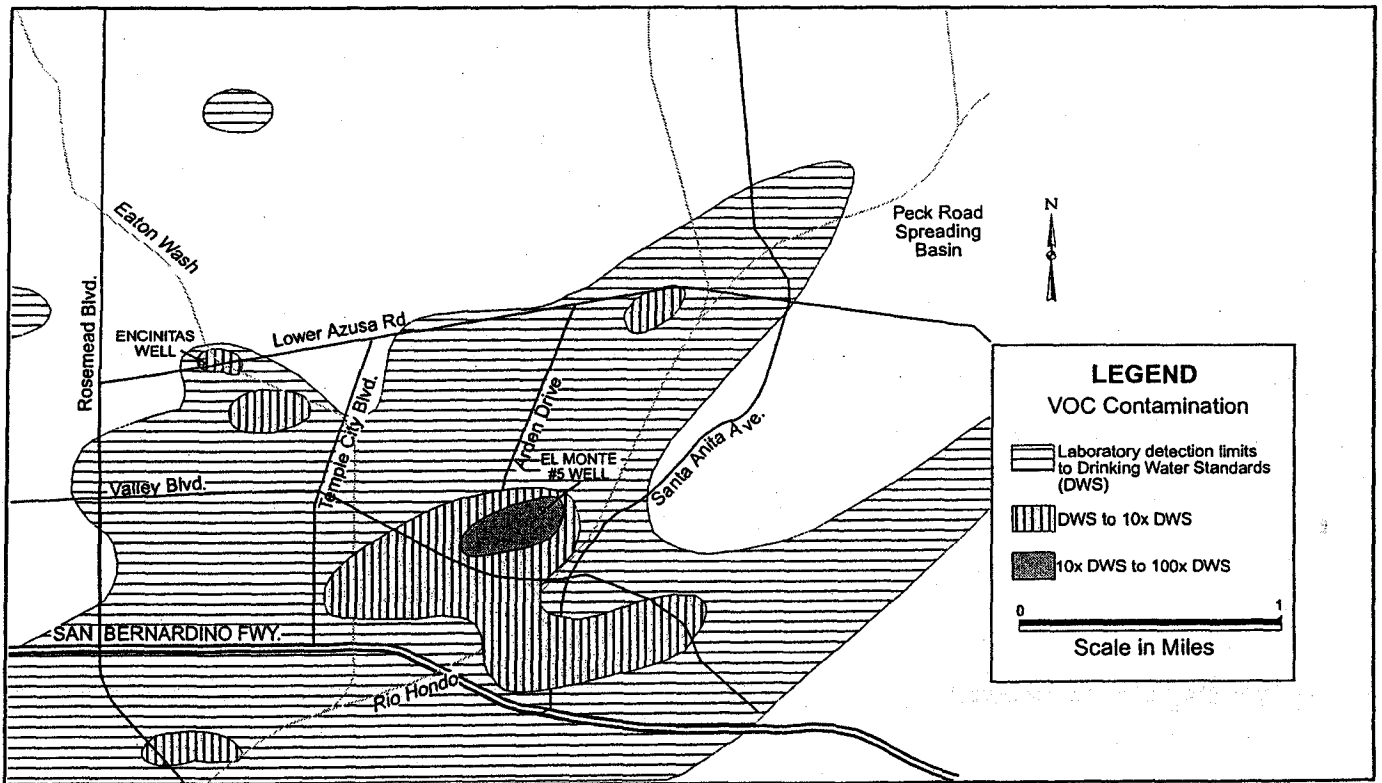


Figure 3: 1997 Deep VOC Contamination

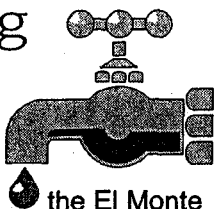


Summary of Site Risks

In 1997, EPA completed a baseline risk assessment for the El Monte OU. The purpose of the risk assessment was to evaluate potential human health effects from exposure to contaminated groundwater. The results of the risk assessment are one factor used by EPA to determine if remedial actions are necessary to protect human health or the environment. EPA has also considered other relevant factors, including drinking water standards, in evaluating the need for interim remedial actions. The risk assessment process includes: a) identifying chemicals present in the groundwater, b) characterizing the population potentially exposed to these contaminants, and c) evaluating the potential health effects resulting from exposure to the contaminated groundwater. For the El Monte OU baseline risk assessment, EPA evaluated two scenarios in which individuals might be exposed to the contaminated groundwater in the absence of any cleanup

Is my drinking water safe?

Yes! Although groundwater contamination has occurred, drinking water extracted from the El Monte OU is treated by the water purveyors to meet all State and Federal drinking water standards. Further, there are currently no drinking water supply wells that draw water from the shallow, highly contaminated zones.



activities or regulatory controls: potential current residential exposure through domestic use and potential future residential exposure to contaminated groundwater through domestic use.

To evaluate risks at a site, EPA uses a "risk management range" of one person in ten thousand (1×10^{-4}) to one person in one million (1×10^{-6}) potentially getting cancer from a lifetime of exposure to the contamination at the site. Risks greater than one in ten thousand (1×10^{-4}) generally require that remedial action be taken. Exceedances of chemical-specific standards such as safe drinking water levels, may also result in the need for remedial action. If risks fall within the risk management range, EPA can evaluate the need for remedial action.

The results of the El Monte OU baseline risk assessment indicate that potential future residential exposure to shallow groundwater through domestic use would result in total estimated cancer risks ranging from five in ten thousand (5×10^{-4}) to two in one thousand (2×10^{-3}). These estimated risks were estimated as the "reasonable maximum exposure" (the highest exposure that is reasonably expected to occur). These elevated potential future risks (in excess of 1×10^{-4}) support EPA's decision to take action in the El Monte OU. It should be noted that EPA's risk estimates are intended to be conservative. In addition, deep zone contamination exceeding drinking water standards has impacted several production wells in the El Monte OU.

Actual or threatened releases of hazardous substances from the El Monte OU, if not addressed by the preferred alternative or one of the other active measures considered, may present a current or potential threat to public health, welfare, or the environment.

EPA's environmental evaluation of potential risks to ecological receptors in the El Monte OU indicates that there are no complete pathways for ecological exposure. Thus, no remedial actions are warranted based on ecological concerns in the El Monte OU.

Remediation Objectives

EPA's Remedial Action Objectives for the El Monte OU are to:

- Prevent exposure of the public to contaminated groundwater;
- Inhibit contaminant migration from more highly contaminated portions of the aquifer to the contaminated areas or depths;
- Reduce the impact of continued contaminant migration on downgradient water supply wells, and;
- Protect future uses of less contaminated and uncontaminated areas.

These objectives reflect EPA's expectation of restoring usable groundwater to its beneficial uses wherever practicable, within a time frame that is reasonable, or, if restoration is deemed impracticable, to prevent further migration of the plume, prevent exposure to the contaminated groundwater, and evaluate further risk reduction (40 Code of Federal Regulations Section 300.430[a][1][iii][F]).

EPA has not established remediation goals for the contaminated portions of the aquifer or a time frame for restoration because this is an interim action to contain contamination. However, the removal of contaminant mass is a second-

ary objective. The proposed remedy will remove significant contamination from the aquifer, in effect beginning the restoration process, but the remedy will be optimized in size and configuration for migration control rather than mass removal.

Summary of Cleanup Alternatives

EPA considered several alternatives to control contaminant migration and reduce risks from potential exposure to the contaminated groundwater. These alternatives are evaluated against eight of the nine specific criteria established in the National Contingency Plan (see page 6). These criteria include consideration of: overall protection of human health and the environment; ability to meet federal and state environmental laws and requirements; reduction of contaminant toxicity, mobility or volume through treatment; short-term effectiveness; long-term effectiveness; implementability; cost; and state acceptance. Evaluation of the community acceptance criterion will be conducted based on comments received during the public comment period. Each alternative evaluated, including EPA's preferred alternative, is summarized in the following sections. All alternatives, except alternative 1, include existing institutional controls that limit the potential for exposure to contaminated groundwater. These institutional controls include state and federal regulations and the main San Gabriel Basin Watermaster controls on groundwater pumping.

Alternative 1 - No Action

Present Worth Cost Estimate: \$0

EPA is required to consider a no action alternative and to evaluate the risk to the public if no action were taken. The No-Action Alternative serves as a basis for comparison with other remedial alternatives under consideration. In this alternative, no remedial actions are taken to control migration of contaminants from or within the El Monte OU. This alternative does not include any groundwater monitoring, extraction, or treatment. There is no cost associated with this alternative and it would provide the least overall protection of human health and the environment. The No-Action Alternative does not meet EPA's remedial action objectives and does not comply with state and federal requirements.

Alternative 2 - Groundwater Monitoring

Present Worth Cost Estimate: \$4.34 Million

Capital Cost Estimate: \$1.25 Million

Annual O&M Cost Estimate: \$0.20 Million

The only remedial action incorporated into this alternative is groundwater monitoring and the abandonment of an inactive production well. The alternative would rely solely on mechanisms such as dilution or dispersion to address contaminant migration. Alternative 2 does not have any groundwater containment, extraction, treatment, conveyance, or discharge components. This alternative includes implementing a monitoring program using new and existing wells to monitor compliance with the El Monte OU remedial action objectives in the shallow and deep zones. Installation of nine new monitoring wells (8 shallow and 1 deep) is assumed for this alternative. This alternative also includes abandonment of inactive production well El Monte No. 5, which may be a potential conduit for downward migration of VOCs.

Alternative 3 - Shallow Groundwater Control in Western El Monte OU

Present Worth Cost Estimate: \$9.62 Million

Capital Cost Estimate: \$2.99 Million

Annual O&M Cost Estimate: \$0.43 Million

This alternative includes the monitoring program and well abandonment from Alternative 2, plus groundwater extraction and treatment components in the shallow zone in the western portion of the El Monte OU. The extraction would generally occur west of Temple City Boulevard. The shallow extraction is intended to control migration of high-level contamination towards the west. This alternative would inhibit migration of contamination into downgradient shallow and deep zones that are currently uncontaminated. Although the primary objective of the extraction wells is containment, they would also be sited to maximize the removal of contaminants from the groundwater. The extracted water would be treated using air stripping with off-gas treatment or liquid-phase carbon adsorption. For cost estimating purposes, this alternative assumes a treatment system consisting of air stripping with carbon adsorption of VOCs in the off-gas. The assumed end use option for this alternative is discharge to Eaton Wash, although other discharge options will be evaluated. The costs presented above assume that treatment of the nitrate and total dissolved

SELECTING A REMEDY

The U.S. EPA uses nine criteria to evaluate alternatives for addressing contamination at a hazardous waste site.

They are:



REMEDY

solids (TDS) present in the shallow groundwater would not be required. However, treatment may be necessary to meet requirements for discharge to surface water. For cost estimating purposes, a reverse osmosis process was assumed to treat elevated TDS and nitrate in the shallow groundwater. If required, the addition of reverse osmosis treatment would increase costs by about 25 percent.

Alternative 4 - Shallow Groundwater Control in Western and Eastern El Monte OU

Present Worth Cost Estimate: \$13.56 Million

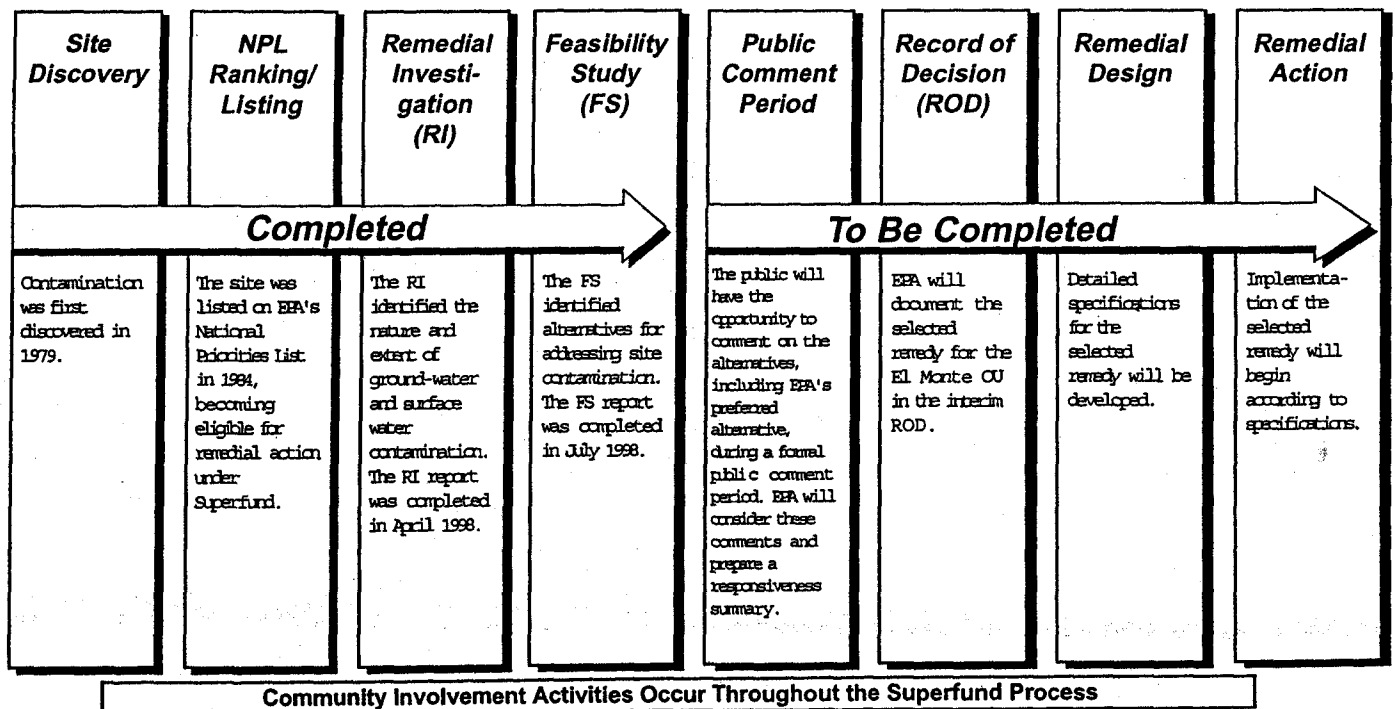
Capital Cost Estimate: \$4.83 Million

Annual O&M Cost Estimate: \$0.57 Million

This alternative includes all of the components of Alternative 3, plus groundwater extraction and treatment components in the shallow zone in the eastern portion of the El Monte OU. The additional extraction would generally occur west of Arden Drive and north of Valley Boulevard. The additional extraction is intended to address westerly and southerly migration of high-level shallow zone contamination located east of the Alternative 3 extraction. Alternative 4

would inhibit migration of contamination into downgradient shallow and deep zones that are currently less contaminated or uncontaminated. Because migration rates in the eastern portion of the shallow zone appear to be relatively slow, the extraction wells can likely be located closer to areas with high concentrations to maximize the removal of contaminants from the groundwater. As in Alternative 3, the extracted water would be treated using air stripping with off-gas treatment or liquid-phase carbon adsorption. For cost estimating purposes, this alternative assumes a treatment system consisting of air stripping with carbon adsorption of VOCs in the off-gas. The assumed end use option for this alternative is discharge to Eaton Wash, although other discharge options will be evaluated. The costs presented above assume that treatment of the nitrate and TDS present in the shallow groundwater would not be required. However, treatment may be necessary to meet requirements for discharge to surface water. For cost estimating purposes, a reverse osmosis process was assumed to treat elevated TDS and nitrate in the shallow groundwater. If required, the addition of reverse osmosis treatment would increase costs by about 35 percent.

Figure 4: The Superfund Process for the El Monte Operable Unit



EPA's Preferred Alternative

Alternative 5 - Shallow Groundwater Control in Western and Eastern El Monte OU plus Deep Groundwater Control

Present Worth Cost Estimate: \$22.67 Million

Capital Cost Estimate: \$7.93 Million

Annual O&M Cost Estimate: \$0.96 Million

EPA's preferred alternative includes containment, extraction, treatment, and monitoring of contaminated groundwater in the shallow and deep zones of the El Monte OU. This preferred alternative includes all of the components described above for Alternative 4, plus groundwater control in two areas of deep zone contamination. One area of deep zone control is in the northwestern portion of the OU in the vicinity of the active Encinitas well field and the second area is in the southern portion of the OU (see Figure 3). Drinking water wells completed in the deep zone in both of these areas have been impacted by VOC contamination.

To develop cost estimates for the Feasibility Study, specific extraction and treatment systems were assumed for the shallow and deep zones. However, this remedial action will incorporate a performance-based approach that provides for flexibility during implementation. The parties responsible for implementing the remedial action could use a different assemblage of extraction and treatment facilities to contain contamination. Performance criteria will be used to ensure that the remedial action is meeting EPA's groundwater containment objectives for this remedial action.

EPA proposes the following performance criteria:

- For the deep zone northwestern area, "the remedial action shall provide sufficient hydraulic control to prevent groundwater contaminated with VOCs above drinking water standards from migrating into or beyond the Encinitas well field."
- For the deep zone southern area, "the remedial action shall apply measures necessary to prevent groundwater contaminated with VOCs above drinking water standards from migrating beyond its current lateral extent."
- For the shallow zone, "the remedial action shall apply measures necessary to prevent groundwater in the shallow zone containing VOC contamination greater than ten times drinking water standards from migrating beyond its current lateral and vertical extent."

Compliance with the deep zone performance criteria will be monitored at monitoring wells located sufficiently downgradient of contamination exceeding drinking water standards to ensure containment of contamination. Addi-

tional monitoring wells may be needed to define the downgradient extent of contamination in the southern deep zone. Compliance wells for the shallow zone will be located downgradient of contamination exceeding ten times drinking water standards and generally within the area where VOC concentrations exceed drinking water standards.

For the northern deep zone contamination, the preferred alternative provides the option of either installing a new extraction well, using the existing Encinitas well field extraction system, or using a combination of the two to provide the necessary containment. For the southern deep zone contamination, the preferred alternative includes abandonment of inactive production well El Monte No. 5 (a potential conduit for downward migration of VOCs), and may include installation of new extraction wells near the downgradient extent of contamination to provide containment.

Groundwater control in the western portion of the shallow zone will generally occur west of Temple City Boulevard. The exact location and magnitude of extraction required in the eastern portion of the shallow zone to meet the performance criteria have not been determined. Additional data collection to determine the extent of contamination will be necessary for remedial design and implementation.

Extracted groundwater will be treated by either air stripping with offgas treatment or liquid-phase carbon adsorption to remove VOCs. Other treatment technologies may be utilized to meet the performance criteria described in this preferred alternative and are evaluated in accordance with the nine criteria outlined on Page 6. For cost estimating purposes, the preferred alternative assumes a treatment system consisting of air stripping with carbon adsorption of VOCs in the off-gas. The most likely end use options are discharge to Eaton Wash (more probable for shallow groundwater) or delivery to a municipal water supply system (more probable for deep groundwater). Other discharge options will be evaluated. The actual treatment technology and end use options will be selected during remedial design.

The estimated cost for this alternative assumes extraction of approximately 350 gallons per minute (gpm) from the shallow zone and 1,300 gpm from the deep zone. The present worth cost for this alternative is \$22.7 million. If extraction is not required to achieve containment of the southern deep zone contamination, then the total costs may be less. However, to meet requirements for discharge to surface water, it may be necessary to treat the extracted shallow groundwater to reduce concentrations of TDS and nitrate (deep groundwater has lower concentrations of these constituents and treatment will not likely be required). For cost estimating purposes, a reverse osmosis process was assumed to treat elevated TDS and nitrate in the shallow groundwater. The present worth cost of this alternative with the use of reverse osmosis treatment for the shallow groundwater is approximately \$27.4 Million.

Table 1: Comparison of Alternatives

ALTERNATIVE EVALUATION TABLE					
Evaluation Criteria	Alternative 1 No action	Alternative 2 Groundwater monitoring	Alternative 3 Shallow Groundwater Control in Western EMOU	Alternative 4 Shallow Groundwater Control in Western and Eastern EMOU	EPA's Preferred Alternative: Alternative 5 Shallow Groundwater Control in Western and Eastern EMOU plus Deep Groundwater Control
Overall Protectiveness	○	○	◐	◐	●
Compliance with State and Federal Requirements	○	◐	◐	◐	●
Long-term Effectiveness	○	○	◐	◐	●
Implement-ability	not applicable	●	◐	◐	◐
Short-term Effectiveness	not applicable	◐	◐	◐	●
Reduction of Toxicity, Mobility or Volume by Treatment	○	○	◐	◐	●
Present Worth Cost	\$0	\$4.34 million	\$9.62 million	\$13.56 million	\$22.67 million
State Agency Acceptance	DTSC and the LARWQCB concur with EPA's preferred alternative.				
Community Acceptance	Community acceptance of the preferred alternative will be evaluated after the public comment period.				
● = Fully meets criterion ◐ = Partially meets criterion ○ = Does not meet criterion					

Future EPA Actions in the El Monte OU

EPA refers to the proposed remedial action as an "interim action" to reflect the possibility that additional actions may be needed in the El Monte OU in the future. EPA will use information gathered during operation of the proposed action to help determine the need for additional actions. One of the critical decisions EPA has to make is whether additional source control actions will be needed to address continuing sources of contamination that may remain even after long-term operation of this groundwater containment action.

Evaluation of Alternatives

Based on EPA's evaluation of the alternatives against eight of the nine criteria (see Table 1), EPA prefers Alternative 5. Alternatives 1 and 2 provide the least overall protection of human health and the environment and do not comply with State or Federal Requirements. Alternatives 3 and 4 address only shallow contamination in the El Monte OU, and do not include remedial actions that provide containment of the deep zone contamination. Deep zone contamination has impacted several production wells in the El Monte OU and EPA believes that controlling further contaminant migration

in the deep zone is critical. Alternative 5 is the only alternative that meets EPA's remedial action objectives in both the shallow and deep zones and best meets the threshold criteria of overall protection of human health and the environment and compliance with State and Federal requirements. Alternative 5 is also ranked highest for the long-term effectiveness criterion because Alternatives 3 and 4 do not provide containment of deep contamination. Alternative 5 would provide greater reduction in toxicity, mobility, and volume of contaminant mass than Alternatives 3 and 4, although a substantially greater quantity of water must be pumped for a relatively small increase in mass removal. Alternatives 3, 4, and 5 are all expected to be equally implementable. Although Alternative 5 costs substantially more than the other alternatives, the additional benefits provided from the deep zone containment far outweigh the additional cost. Overall, Alternative 5 provides the best balance in tradeoffs between the evaluation criteria. The Feasibility Study Report for the El Monte OU provides a more detailed evaluation of the alternatives with respect to the nine criteria.

EPA expects the preferred alternative to satisfy the statutory requirements in CERCLA Section 121(b) to: 1) be protective of human health and the environment; 2) comply with ARARs; 3) be cost-effective; 4) utilize permanent solutions and alternative treatment technologies to the maximum extent practicable; 5) satisfy the preference for treatment as a principal element. ■

**EXPLANATION OF SIGNIFICANT DIFFERENCES
TO THE 1999 RECORD OF DECISION
EL MONTE OPERABLE UNIT
SAN GABRIEL VALLEY SUPERFUND SITES, AREA 1**

Introduction and Purpose

The United States Environmental Protection Agency (EPA) is updating the Superfund cleanup plan for the El Monte Operable Unit ("El Monte OU") of the San Gabriel Valley (Figure 1) in Los Angeles County, California in response to the detection, in 2000 and 2001, of several new pollutants in the groundwater underlying the area. The EPA adopted the original El Monte OU cleanup plan in 1999 after extensive public comment. The newly detected chemicals include:

- perchlorate, used in solid rocket fuel;
- hexavalent chromium, used in metal plating;
- N-nitrosodimethylamine (NDMA), found in liquid rocket fuel; and
- 1,4-dioxane, a stabilizer in chlorinated solvents.

In addition to the recently detected contaminants, groundwater in the El Monte OU is contaminated with perchloroethylene (PCE), trichloroethylene (TCE), and other chlorinated solvents. Chlorinated solvents are members of a group of chemicals called "volatile organic compounds" or VOCs.

The detection of perchlorate, hexavalent chromium, NDMA, and 1,4-dioxane will change the cleanup project in the El Monte OU in one significant way. The technologies typically used to remove chlorinated solvents from water (air stripping and carbon adsorption) do not effectively remove perchlorate, hexavalent chromium, NDMA, or 1,4-dioxane. If installation of additional treatment facilities is required to treat the newly detected contaminants in the groundwater, it will significantly increase the cost of the cleanup, as described below. Final decisions on treatment processes will be made during remedial design.

When significant changes are needed in a Superfund cleanup plan, the EPA informs the community through an Explanation of Significant Differences (ESD) or a Record of Decision (ROD) amendment. In this instance, EPA has determined that an ESD is appropriate. The remainder of the document provides a brief history of the El Monte OU cleanup, summarizes the 1999 cleanup plan, and describes the change to the 1999 plan in more detail.

EPA is issuing this Explanation of Significant Differences to satisfy its public participation responsibilities under CERCLA Section 117(c) and NCP Section 300.435(c)(2)(i).

This ESD will become part of the Administrative Record file for the El Monte OU pursuant to NCP Section 300.825(a)(2) and will be available to the public at the following locations:

EPA Region 9 Superfund Records Center
75 Hawthorne Street
San Francisco, CA 94105 • (415) 536-2000

The Record Center's hours are 8:00 am to 5:00 p.m., Monday through Friday.

West Covina Public Library
1601 West Covina Parkway
West Covina, CA 91790
(626) 962-3541

Rosemead Library
8800 Valley Boulevard
Rosemead, CA 91770
(626) 573-5220

For hours of operation, interested parties may call the libraries at the numbers listed above.

The ESD is also available on the EPA's web site at <http://yosemite.epa.gov/r9/sfund/rodex.nsf> under the San Gabriel Valley (Area 1) heading.

The El Monte Cleanup: A Brief History

The Context: San Gabriel Valley Groundwater Contamination

Groundwater contamination in the San Gabriel Valley was discovered in 1979. In 1984, the EPA added four portions of the San Gabriel Valley to the national Superfund list. The El Monte OU is officially part of the *San Gabriel Valley Area 1* Superfund site. Investigations by the EPA and others revealed the large extent of groundwater contamination in the El Monte OU and the San Gabriel Valley. During the past 20 years, numerous water supply wells throughout the San Gabriel Valley have been found to be contaminated with chlorinated solvents and other VOCs. In response to the contamination, water companies have shut down contaminated wells, installed new treatment facilities, and taken other steps to ensure that they can continue to supply water meeting State and Federal drinking water standards for VOCs.

Contamination of El Monte Groundwater

In 1998, the Northwest El Monte Community Task Force ("NEMCTF"), a group of fifteen parties considered potentially responsible for contamination of groundwater (Potentially Responsible Parties or "PRPs") in the El Monte area, completed the remedial investigation/feasibility study ("RI/FS") for the El Monte OU of the San Gabriel Valley Superfund sites. The remedial investigation determined that PCE, TCE, and other volatile organic compounds were contaminating the shallow and deep groundwater aquifers in a ten-square-mile area of the San Gabriel Valley around El Monte. Businesses in El Monte and surrounding areas had used these chemicals for degreasing, metal cleaning, and other purposes, and had probably released them to the ground through a combination of on-site disposal, careless handling, leaking pipes, and other means.

The study found that the uppermost, or shallow, aquifer includes most of the known sources of the groundwater contamination. VOC contaminant concentrations in portions of the shallow aquifer

are hundreds of times drinking water standards (see Figure 2). In the deep aquifer, VOC contaminant concentrations are lower but still exceed drinking water standards (see Figure 3).

The NEMCTF has since continued to install and sample monitoring, extraction, and compliance wells, model the groundwater aquifers, and evaluate options for discharging treated groundwater, all in order to prepare for the implementation of cleanup work.

EPA Adopts Cleanup Plan

On June 23, 1999, the EPA adopted a cleanup plan for the El Monte OU known as the *El Monte Operable Unit Record of Decision*. The plan addresses the contamination described in the RI/FS. The goals of the 1999 cleanup plan are to prevent exposure of the public to VOC-contaminated groundwater, limit the movement of VOC-contaminated groundwater into clean or less contaminated areas and depths, reduce the impact of continued contaminant migration on downgradient water supply wells, and protect future uses of uncontaminated areas.

The 1999 cleanup plan calls for pumping the VOC-contaminated groundwater from two aquifers beneath the El Monte OU and treating it to remove the contaminants. More specifically, the plan calls for the construction and operation of groundwater extraction wells, treatment facilities, and conveyance facilities capable of pumping and treating approximately 1,325 and 330 gallons per minute of VOC-contaminated groundwater from the deep and shallow aquifers, respectively. The plan will require construction of new wells and treatment facilities for the shallow aquifer. For the deep aquifer, the plan allows for the use of existing water supply wells, treatment systems, and pipelines if possible, and the construction of new facilities where needed. Final decisions on extraction rates and locations will be made during the remedial design phase of the project.

Reason for this Action: Detection of Perchlorate, Hexavalent Chromium, NDMA, and 1,4-Dioxane in the El Monte OU

After the discovery in 1997 and 1998 of perchlorate, NDMA, and 1,4-dioxane in the Baldwin Park area, and hexavalent chromium in the San Fernando Valley approximately 10 miles northeast of the San Gabriel Valley, the Los Angeles Regional Water Quality Control Board requested that facilities in several areas of the San Gabriel Valley, including the El Monte OU, sample their groundwater monitoring wells for these "emergent chemicals." In 2000 - 2001, the NEMCTF and its members sampled selected shallow groundwater monitoring wells within areas of VOC contamination as part of the pre-design activities in the El Monte OU and tested for emergent chemicals. Perchlorate, hexavalent chromium, NDMA, and 1,4-dioxane were detected in shallow groundwater in the El Monte OU.

Maximum concentrations of perchlorate and NDMA exceed the State drinking water action levels of 4 ppb and 0.010 ppb, respectively. The maximum concentration of 1,4-dioxane is more than 20 times the State drinking water action level of 3 ppb. The maximum concentration of hexavalent chromium does not pose a risk to human health but exceeds the Federal standard for protection of freshwater aquatic life in inland surface waters and is of concern if treated water is discharged to

surface water. Figures 4, 5, 6 and 7 depict the approximate extent of perchlorate, hexavalent chromium, NDMA and 1,4-dioxane contamination in shallow groundwater in the El Monte OU.

Sampling of groundwater in the deep aquifer of the El Monte OU shows that perchlorate is the only one of the four constituents that has exceeded the State drinking water action level. Perchlorate was detected at a concentration of 5.9 ppb in a well that was subsequently destroyed. Perchlorate was not detected in wells downgradient of the destroyed well and thus additional treatment processes for groundwater extracted from the deep aquifer in the El Monte OU are not anticipated to be necessary at this time, but may be required in the future.

In July 2001, EPA sent *Special Notice* letters to 27 PRPs to begin formal EPA-PRP negotiations to obtain a binding commitment from the PRPs to carry out the El Monte cleanup plan for the design, construction, and operation of the groundwater extraction, treatment, and discharge facilities specified in the El Monte OU ROD. EPA is currently negotiating this commitment, called a Consent Decree, including provisions for treatment of emergent chemicals, if warranted, with a group of El Monte OU PRPs.

Because the emergent chemicals were discovered after EPA issued the El Monte OU ROD, EPA is now modifying the cleanup decision to address the emergent chemicals. The emergent chemicals may require treatment, and if so, one or more of the treatment technologies described below will be required. To the extent treatment is required for the emergent chemicals, the groundwater has to be treated to achieve the treatment levels described below.

Table 1 shows the significant differences between the remedy as presented in the 1999 ROD and the action now proposed.

Description of Treatment Options

Perchlorate

Since 1997, when perchlorate was discovered in the San Gabriel Valley groundwater basin, technology for removing perchlorate from groundwater has made great strides. The California Department of Health Services (DHS) has determined that two perchlorate removal technologies are acceptable: biological treatment and ion exchange.

In the biological treatment process, nutrients are added to the contaminated water to sustain microbes that destroy perchlorate. The microbes convert the perchlorate ion to oxygen and chloride, which are present at low levels in all drinking water. The biological treatment process is being used in a full-scale treatment system at the Aerojet Superfund site in northern California. Biological treatment methods are new to many water utilities, but *biologically active* filters have been used in drinking water treatment for decades to help remove particles and biodegradable organic matter.

The second perchlorate-removal technology is ion exchange, in which the perchlorate ion is

replaced by chloride, a chemically similar but non-toxic ion. Ion exchange processes have been used in homes and businesses for *softening* hard water for decades. In the Spring of 2001, a 2,500-gallon-per-minute groundwater treatment system using ion exchange to remove perchlorate went online in the Baldwin Park Operable Unit, producing potable water for use in the San Gabriel Valley. The principal disadvantage of ion exchange systems is that they only remove the perchlorate, they don't destroy it, and the perchlorate still needs to be appropriately managed after it is removed.

Both biological treatment and ion exchange processes have an added benefit. The groundwater in some parts of the San Gabriel Valley, including portions of the shallow aquifer in the El Monte OU, is unusable because of high levels of nitrate believed to be the result of past agricultural practices in the Valley. Both treatment process would also remove much of the nitrate from the water.

Other technologies have been proven capable of removing perchlorate from water, but probably at a higher cost. Liquid-phase granular-activated-carbon (LGAC) filtration can potentially remove perchlorate, but only for a limited period of time before regeneration or replacement of the carbon is required. Frequent carbon replacement would make relying solely on LGAC for perchlorate removal very expensive. Conventional filtration, sedimentation, or air-stripping technologies cannot remove perchlorate from water.

Hexavalent Chromium

Ion exchange treatment can remove hexavalent chromium from groundwater just as it does perchlorate. A benefit of using ion exchange treatment is that it would remove both perchlorate and hexavalent chromium from the water. Reverse osmosis will also remove hexavalent chromium from groundwater, but is much more expensive to operate than the ion exchange process. Chemical reduction technologies can also remove hexavalent chromium from water. Chemical reduction involves adding a chemical to provide a source of electrons to reduce hexavalent chromium (Cr^{+6}) to trivalent chromium (Cr^{+3}), which precipitates from the water. Though chemical reduction is comparable in cost to ion exchange treatment for removing hexavalent chromium, it does not also remove perchlorate from the water as ion exchange treatment does.

NDMA and 1,4-Dioxane

Ultraviolet (UV) light can remove NDMA from groundwater. In a UV treatment system, the water passes through a tank containing numerous ultraviolet lamps. The NDMA molecules absorb the light energy, which cause them to break down into smaller nontoxic molecules. UV light treatment, in combination with injection of an oxidant such as hydrogen peroxide, also removes 1,4-dioxane. UV treatment systems have successfully removed both chemicals from water in locations throughout the United States. A 2,500-gpm treatment system using UV with oxidation for NDMA and 1,4-dioxane removal is in operation in the Baldwin Park Operable Unit of the San Gabriel Valley sites.

Treatment Levels

Drinking Water Standards

The treatment technologies used in the El Monte OU will have to be capable of effectively and reliably removing VOCs, and, if necessary, perchlorate, hexavalent chromium, NDMA, and 1,4-dioxane, from the groundwater. If any of the treated groundwater, shallow or deep, is to be used as drinking water, treatment technologies must reduce the concentrations of all contaminants to below Federal and State drinking water standards in existence at the time that the water is treated, as measured at the consumers' taps. Generally, the applicable drinking water standard is the Maximum Contaminant Levels (MCL) established by State and Federal regulation. However, while MCLs have been established for some of the chemicals in the groundwater in the El Monte OU, none of the recently detected "emergent chemicals" has a MCL. Total chromium (e.g., Cr⁺³ and Cr⁺⁶ concentrations combined) has a MCL of 50 ppb, which is considered to protect the public's health from hexavalent chromium.

Safe levels for some chemicals that lack MCLs are specified by *action levels* developed by the California Department of Health Services (DHS). DHS has established action levels for perchlorate (4 ppb); NDMA (0.010 ppb); and 1,4-dioxane (3 ppb). Although not an enforceable standard, an action level is the concentration of a contaminant in drinking water that DHS has determined, based on available scientific information, provides an adequate margin of safety to prevent potential risks to human health. California Health & Safety Code Section 116455 requires that the operator of a public water system notify local government authorities when a drinking water well exceeds an action level. In addition, DHS recommends that drinking water purveyors notify the public if action levels are exceeded, unless the wells in question are taken out of service.

Applicable or Relevant and Appropriate Requirements: Water Quality Standards

EPA's cleanup plan also allows for recharging some or all of the treated water, that is, pumping it back into the groundwater basin instead of delivering it for use as drinking water. As discussed in greater detail in the Record of Decision, any recharged water must comply with the pertinent water quality objectives in the Los Angeles Regional Water Quality Control Board Basin Plan. In addition, State Water Resources Control Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," applies to any recharge of treated groundwater into the aquifer. Resolution No. 68-16 requires maintenance of existing State water quality unless it is demonstrated that a change will benefit the people of California, will not unreasonably affect present or potential uses, and will not result in water quality less than that prescribed by other State policies. In addition, in accordance with the Clean Water Act, EPA has established water quality goals for organic and inorganic constituents in water discharged to inland surface waters. These goals, referred to as the California Toxics Rule (CTR), were established to be protective of human health and freshwater aquatic life. The goal for hexavalent chromium is a 4-day average concentration of 11 ppb. In light of these requirements, any groundwater recharged into the aquifer, including water discharged to surface water channels, must be below action levels

of 4 ppb for perchlorate, 0.010 ppb for NDMA, and 3 ppb for 1,4-dioxane, and below the CTR goal of 4-day average concentration of 11 ppb for hexavalent chromium.

The treatment levels discussed above apply to the groundwater after it is pumped above ground. Though the 1999 cleanup plan for the El Monte OU established contaminant levels to meet the objective of limiting the movement of contaminated groundwater into clean or less contaminated areas and depths, neither the 1999 cleanup plan nor this update establish cleanup levels for water in situ (i.e., in the aquifer). EPA plans to evaluate in-situ cleanup levels in a future action, as part of the final Record of Decision for the El Monte OU.

In 1999, the EPA estimated the cost of the cleanup at \$8 million in capital costs and \$960,000 per year for operation and maintenance costs. EPA's revised cost estimate, which includes additional treatment for removing the newly detected chemicals in shallow groundwater, is a potential \$13 million in capital costs and \$1.5 million per year in operation and maintenance costs. The revised cost estimate is based on evaluation of the latest treatment options for the newly detected chemicals and on extraction and treatment rates from the 1999 cleanup plan.

The additional treatment technologies that may be needed to remove the new contaminants are responsible for the increase in the estimated cost of the cleanup in the El Monte OU.

Final Selection of Treatment Technologies

EPA will select the final treatment technologies for the El Monte OU over the next year during completion of pre-design activities and the design of the El Monte cleanup facilities. During this time, additional cost and performance data from operation of full-scale treatment systems in the San Gabriel Valley and the results of treatment studies elsewhere will become available. EPA will incorporate this information into the selection of treatment technologies for the El Monte OU.

State Concurrence

The State of California, through the Department of Toxic Substances Control and the Los Angeles Regional Water Quality Control Board, supports the changes described in this document.

Statutory Determination

The modified cleanup plan for the El Monte OU remains protective of human health and the environment and will continue to meet all applicable or relevant and appropriate requirements identified in the 1999 Record of Decision, as required by CERCLA Section 121(d).

Public Participation Compliance

Several EPA community involvement opportunities have occurred in response to EPA and PRP actions in the El Monte OU. EPA issued an update on the San Gabriel Valley Superfund Sites in

April 1998, which mentioned development of an "early action" project for the El Monte OU. EPA's Proposed Plan to address groundwater contamination in the El Monte OU was mailed in October 1998 with a 60 day public comment period. This was followed by a community meeting on the Proposed Plan where the public was again given the opportunity to comment. EPA addressed all comments on the Proposed Plan in a Responsiveness Summary attached to the 1999 ROD. The community meeting was followed by a fact sheet issued in July 1999, in which EPA updated the status of the El Monte OU interim remedy design activities. And, EPA issued an update on the San Gabriel Valley Superfund Sites in May 2002, which mentioned the detection of perchlorate, hexavalent chromium, NDMA, and 1,4- dioxane in the shallow groundwater of the El Monte OU.

An ESD notice was published in July 2002 in a local newspaper as required by the NCP, section 300.435(c)(2)(i)(B). The public participation requirements set out in the NCP, sections 300.435(c)(2)(i) and 300.825(a)(2) will continue to be met.

/Signed/

John Kemmerer, Chief
Superfund Site Cleanup Branch
U.S. Environmental Protection Agency, Region 9

August 22, 2002

Date

Table 1. Comparison of Cleanup Plans – Most Aspects of the 1999 Plan Have Not Changed

	ORIGINAL CLEANUP PLAN	UPDATED CLEANUP PLAN
Remedial Objectives	Prevent exposure, limit further migration of contaminated groundwater, reduce impacts on down-gradient water supply wells, protect future uses of clean areas.	Same
Groundwater Extraction Areas	Extract groundwater from the deep aquifer and two areas of contamination in the shallow aquifer	Same
Groundwater Extraction Rates	Extract contaminated groundwater at rates needed to meet remedial objectives. Determine final rates during remedial design. Initial estimate was 1,325 gpm deep and 330 gpm shallow	Same
Groundwater Treatment Technologies light	Use air stripping and carbon treatment to remove VOCs from the groundwater . Finalize technologies during remedial design	Use same technologies to remove VOCs. Potentially use ion exchange to reduce perchlorate and hexavalent chromium, UV to remove NDMA and with oxidation, 1,4-dioxane. Select technologies during remedial design.
Groundwater Treatment Standards	Design treatment systems to reduce VOC concentrations to below MCLs	Reduce VOC concentrations to below MCLs, reduce perchlorate, NDMA, and 1,4-dioxane concentrations to below State action levels, and hexavalent chromium to Federal surface water goals
Use of Treated Groundwater	Supply deep water to water companies for distribution, return shallow water to the groundwater basin or supply to industries. Make final decision during remedial design	Same
Project Costs	Estimated capital costs of \$8 million; estimated operation and maintenance costs of \$960,000/year	Estimated capital costs potentially increase to \$13 million; estimated operation and maintenance costs potentially increase to \$1.5 million/year

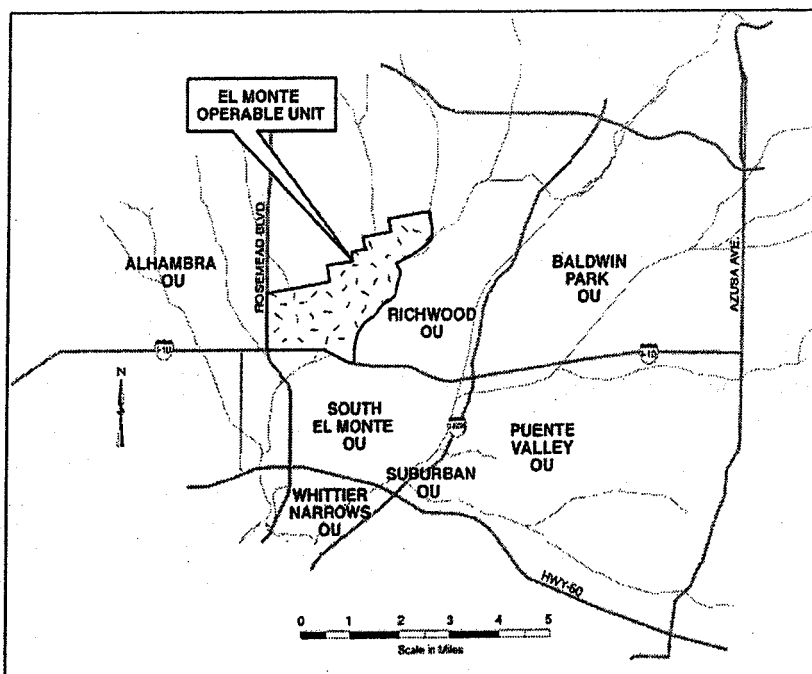


Figure 1: Location of the El Monte Operable Unit and other San Gabriel Valley Superfund Site Projects

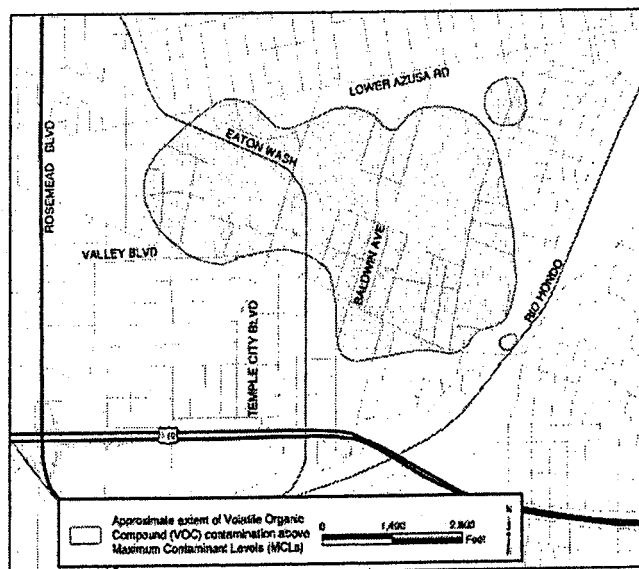


Figure 2: Approximate extent of VOC contamination in shallow groundwater

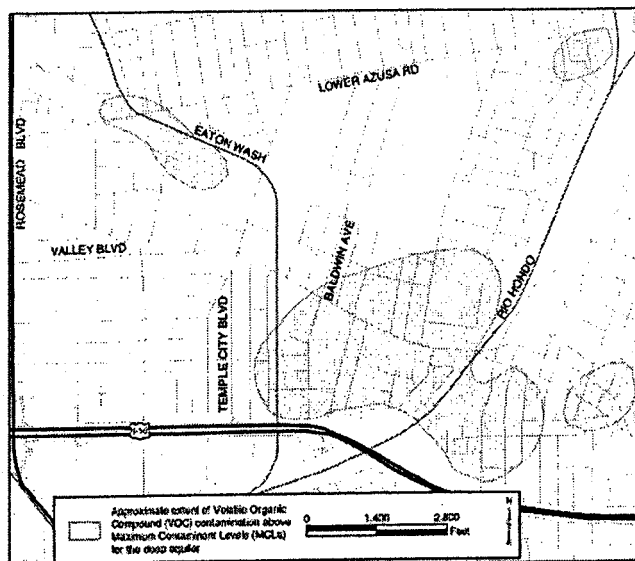


Figure 3: Approximate extent of VOC contamination in deep groundwater

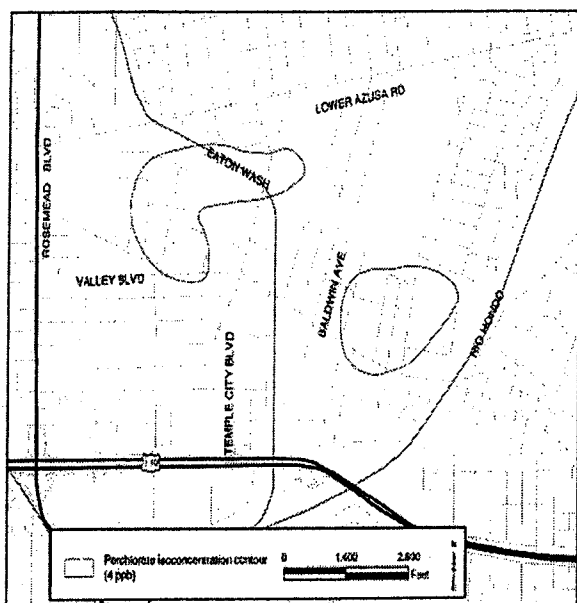


Figure 4: Approximate extent of Perchlorate contamination in shallow groundwater

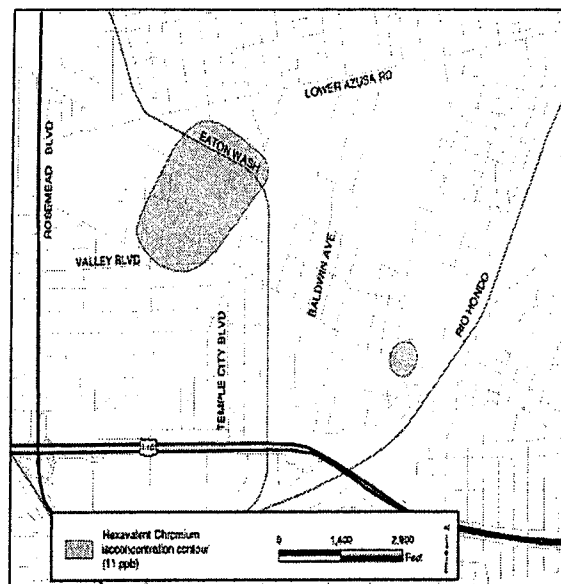


Figure 5: Approximate extent of Hexavalent Chromium contamination in shallow groundwater

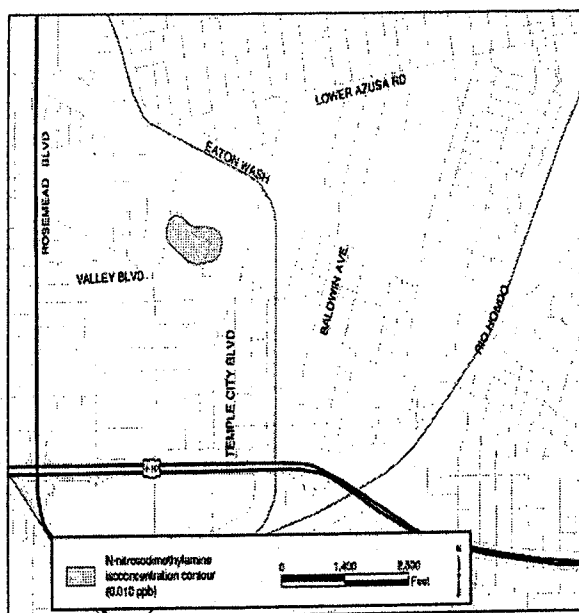


Figure 6: Approximate extent of NDMA contamination in shallow groundwater

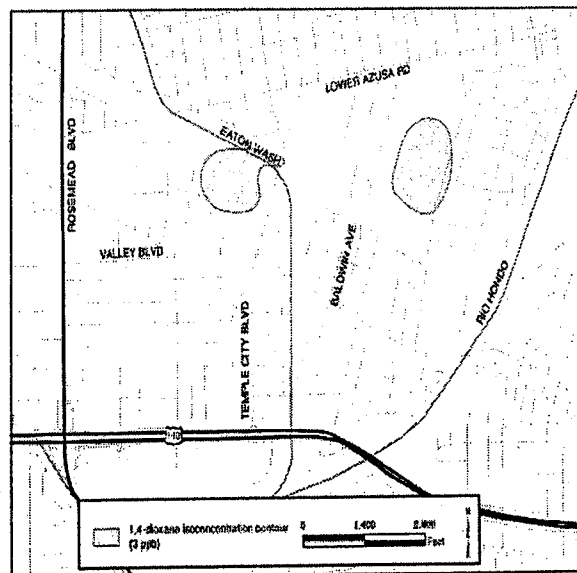


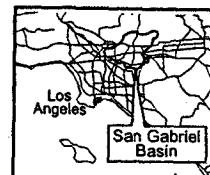
Figure 7: Approximate extent of 1,4-Dioxane contamination in shallow groundwater

APPENDIX H

**San Gabriel Valley Superfund Site: Whittier Narrows Operable Unit
Proposed Plan
USEPA, Region 9
October 1998**



San Gabriel Valley Superfund Site: Whittier Narrows Operable Unit Proposed Plan



U.S. Environmental Protection Agency • Region 9 • San Francisco, Ca • October 1998

EPA PROPOSES PLAN TO ADDRESS GROUNDWATER CONTAMINATION IN THE WHITTIER NARROWS OPERABLE UNIT

INTRODUCTION

The U.S. Environmental Protection Agency (EPA) is seeking public comments about this Proposed Plan for the Whittier Narrows Operable Unit of the San Gabriel Valley Superfund Site in Los Angeles County, California. In accordance with Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, EPA is announcing the Proposed Plan to solicit public review and comment.

This Proposed Plan presents EPA's preferred alternative for addressing groundwater contamination in Whittier Narrows and another alternative considered. EPA encourages you to review and comment on the preferred alternative described in this Proposed Plan prior to the close of the public comment period (November 30, 1998). This Proposed Plan summarizes the more detailed information found in the Whittier Narrows Operable Unit Feasibility Study Addendum Report and other documents in the Administrative Record. These documents are available for review at the information repositories listed on page 9. EPA encourages the public to review these documents to gain a more comprehensive understanding of the Whittier Narrows Operable Unit and the associated Superfund activities.

A community meeting will be held on Thursday, November 19, 1998 to discuss the two alternatives presented in this plan and to take your comments (see

adjacent box for details). In addition to presenting your comments at the public meeting, you may also comment in writing during the public comment period from October 26 to November 30, 1998.

EPA's objective for the preferred remedy is to protect human health and the environment, by protecting the groundwater resource in Whittier Narrows and the Central Basin. EPA is proposing to extract, treat, and monitor contaminated groundwater in the shallow and intermediate zones in the general vicinity of the Whittier Narrows Dam to prevent further migration of groundwater contamination from the San Gabriel Basin, through Whittier Narrows, into the Central Basin.

As the lead agency for the Whittier Narrows Operable Unit, EPA has worked with the Los Angeles Regional Water Quality Control Board (LARWQCB) and the California Department of Toxic Substances Control (DTSC) on this site. The LARWQCB concurs with EPA's preferred alternative. DTSC is currently reviewing EPA's proposal. EPA has also worked closely with local stakeholders in both the Central and San Gabriel Basins throughout the Remedial Investigation/Feasibility Study (RI/FS) process in the Whittier Narrows Operable Unit. After receiving comments from the public and local stakeholders, EPA, in consultation with DTSC and the LARWQCB, will select

COMMUNITY MEETING

Proposed Plan for the Whittier
Narrows Operable Unit
Thursday, November 19, 1998
7:00 to 9:00 p.m.
South El Monte High School
1001 N. Durfee Avenue
South El Monte
(626) 442-0218

(See map on last page for directions)

At this meeting, EPA representatives will present the two alternatives evaluated and describe EPA's preferred alternative. You will have the opportunity to ask questions, and give written and verbal comments on the two alternatives described in the Proposed Plan and other related documents. EPA encourages you to comment on the Proposed Plan and other site-related documents during the public comment period (October 26, to November 30, 1998). Verbal or written comments may be submitted at the community meeting. You may also submit comments by mail, fax or e-mail to:

Doug Frazer
Remedial Project Manager
U.S. EPA Region 9
75 Hawthorne Street (SFD-7-3)
San Francisco, CA 94105
Telephone: (415) 744-2259
Fax: (415) 744-2180
e-mail: frazer.doug@epa.gov

*Note: Comments sent by mail must be postmarked no later than November 30, 1998. Comments sent by phone, fax, or e-mail must be received no later than November 30, 1998.

Cont'd. on pg. 3

SITE BACKGROUND

Groundwater in the San Gabriel Valley is the primary drinking water source for more than one million people. Regional groundwater contamination by volatile organic compounds (VOCs) prompted EPA to place the San Gabriel Valley on the National Priorities List in 1984. This list identifies the highest priority hazardous waste sites in the United States for investigation and cleanup.

The Whittier Narrows Operable Unit is one of eight Operable Units within the San Gabriel Valley Superfund Site, located in eastern Los Angeles County, California (Figure 1). The term "Operable Unit" (OU) is used to define a discrete action that is an incremental step toward a comprehensive site remedy. Operable Units may address certain geographic areas, specific site problems, initial phases of a remedy, or a set of actions over time. In addition to the Whittier Narrows Operable Unit, EPA has identified seven other OUs at the San Gabriel Valley Superfund Site. These are the Alhambra OU, Baldwin Park OU, El Monte OU, Puente Valley OU, Richwood OU, South El Monte OU, and Suburban OU.

EPA designated the Whittier Narrows as an Operable Unit specifically to address groundwater contamination flowing out of the San Gabriel Basin, through Whittier Narrows, into the Montebello Forebay portion of the Central Basin. The Montebello Forebay area is the primary source of recharge for the Central Basin's drinking water aquifers. Groundwater contamination migrating from the San Gabriel Basin into this area could impact the water supply for millions of Central Basin water users.

The Whittier Narrows Operable Unit is located in the southern portion of the San Gabriel Basin and represents the primary discharge point for groundwater and surface water flow exiting the basin. Whittier Narrows is a 1.5-mile gap in the low-lying hills that separate the San Gabriel Basin and the Central Basin. The Whittier Narrows Operable Unit is bounded to the north by the South El Monte Operable Unit at the Pomona Freeway (Highway 60). South of Whittier Narrows lies the Montebello Forebay portion of the Central Basin. Groundwater flow in the Whittier Narrows Operable Unit is principally from northeast to southwest from the San Gabriel Basin into the Central Basin. There are shallow, intermediate, and deep drinking water and irrigation wells located within Whittier Narrows and immediately downgradient in the Central Basin. Most of the Whittier Narrows Operable Unit is undeveloped land dedicated to flood control and outdoor recreational uses. The Whittier Narrows Operable Unit is surrounded by densely populated residential, commercial and light industrial areas. Industrial activities within the Whittier Narrows Operable Unit are generally limited to the far eastern portion of the Narrows.

EPA began investigation activities in the Whittier Narrows Operable Unit in the late 1980s. The information collected during this investigation indicated that levels of contamination migrating through Whittier Narrows and into the Central Basin posed a minimal risk. In 1993, EPA issued a Record of Decision calling for continued groundwater monitoring in the Whittier Narrows Operable Unit, along with installation of additional monitoring wells. In recent years, the monitoring data generated from these wells has indicated increasing VOC concentrations in western Whittier Narrows groundwater. In 1997, in response to the rising concentrations, EPA initiated further investigations and an evaluation of alternatives to protect the area's groundwater resource. EPA used this evaluation to develop the preferred remedy described in this Proposed Plan.

VOCs are the primary groundwater contaminants found above state and federal drinking water standards in the Whittier Narrows Operable Unit. Tetrachloroethene (PCE) and Trichloroethene (TCE) have been detected most often in groundwater, although there are sporadic detections of other VOCs in excess of drinking water standards. Elevated VOC contamination primarily occurs in the western half of Whittier Narrows and mainly consists of PCE. The highest PCE concentrations are found in the shallow groundwater (up to 100 feet below ground surface), but exceedances of drinking water standards for both of PCE and TCE have been detected up to 400 feet below ground surface in western Whittier Narrows.

PCE concentrations just above drinking water standards have also been detected in isolated locations in the Montebello Forebay, downgradient of Whittier Narrows. Figures 2 and 3 show estimated 1998 VOC concentrations in the shallow and intermediate zones. The shallow and intermediate VOC contamination found in western Whittier Narrows is migrating into the Operable Unit from upgradient contaminant sources. EPA has not found any significant sources of contamination within the western portion of the Whittier Narrows Operable Unit. Remediation of the upgradient contaminant sources will occur as part of activities in other Operable Units in the San Gabriel Basin.

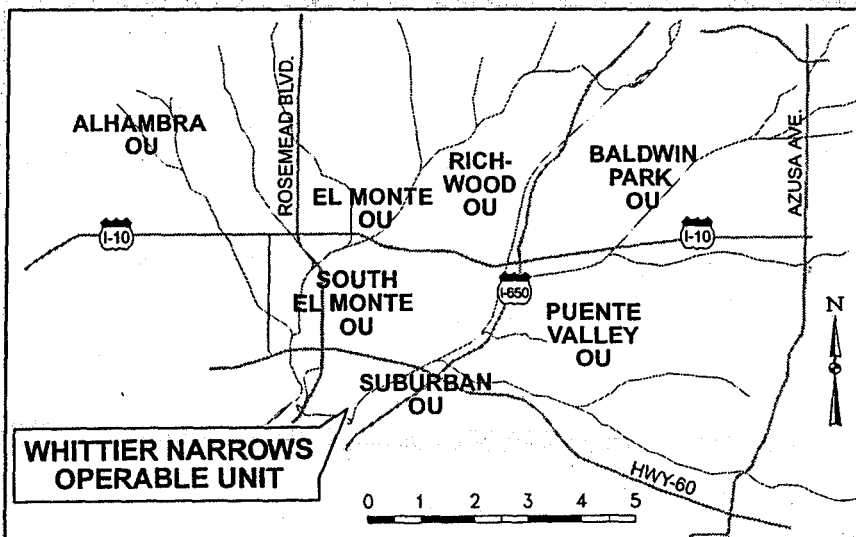


Figure 1: Location map of Whittier Narrows Operable Unit

one of the two alternatives presented in this Plan. EPA will then summarize the selected alternative in an Amended Record of Decision for the Whittier Narrows Operable Unit.

Public input on the cleanup alternatives, and on the information that supports the alternatives, is an important consideration in the remedy selection process. The public is encouraged to comment; your comments can influence EPA's decision. If warranted, the final cleanup remedy could differ from EPA's preferred alternative based on public comments or new information that EPA receives.

SUMMARY OF SITE RISKS

EPA originally completed a baseline risk assessment for the Whittier Narrows Operable Unit in 1992. The baseline risk assessment has since been updated with addenda in 1997 and again in 1998. The purpose of the risk assessment and addenda was to evaluate potential health effects from exposure to contaminated groundwater. The results of the risk assessment are one factor that EPA uses to determine whether remedial actions are necessary to protect human health or the environment. The risk assessment process includes: a) identifying types and amounts of chemicals present in the groundwater, b) characterizing the population potentially exposed to these contaminants, and c) evaluating the potential health effects that would result from exposure to the contaminated groundwater. For the risk assessment, EPA evaluated the risks to an individual potentially exposed to contaminated groundwater through residential use.

To evaluate cancer risks at a site, EPA uses a "risk management range" of one person in ten thousand (1×10^{-4}) to one person in one million (1×10^{-6}) potentially getting cancer from a lifetime of exposure to the contamination at the site. Risks greater than one in ten thousand (1×10^{-4}) generally require that remedial action be taken. If risks fall within the risk management range, EPA can evaluate the need for remedial action. Action may also be required if chemical-specific standards such as drinking water standards are exceeded.

The results of the most recent addendum to the Whittier Narrows Operable Unit baseline risk assessment indicate that potential exposure through domestic use to the most highly-contaminated shallow groundwater in Whittier Narrows would result in a total estimated lifetime cancer risk exceeding one in ten thousand (1×10^{-4}). The estimated cancer risk for other portions of the shallow zone and for the intermediate zone falls within the one in one million (1×10^{-6}) to one in ten thousand (1×10^{-4}) range. The overall risk for non-cancer health effects posed by contaminants in Whittier Narrows groundwater was found to be well below the level of concern.

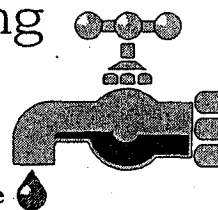
The existence of an elevated potential future cancer risk supports EPA's decision to take action in the Whittier

Narrows Operable Unit. Actual or threatened releases of hazardous substances from the Whittier Narrows Operable Unit, if not addressed by the preferred alternative, may present a current or potential threat to public health, welfare, or the environment.

Is my drinking water safe?

Yes! Although groundwater contamination has occurred,

drinking water extracted from the Whittier Narrows and Central Basin OU is treated by the water purveyors to meet all State and Federal drinking water standards. Further, there are currently no drinking water supply wells that draw water from the shallow, highly contaminated zones.



REMEDIATION OBJECTIVES

EPA's Remedial Action Objective for the Whittier Narrows Operable Unit is to protect groundwater resources in Whittier Narrows and the Montebello Forebay portion of the Central Basin from VOC contamination emanating from the San Gabriel Valley. To the extent technically and economically feasible, EPA intends to control VOC migration in the San Gabriel Valley so that groundwater extracted from Whittier Narrows and Montebello Forebay production wells will not exceed drinking water standards.

Groundwater contaminated with PCE at levels just above the drinking water standard has been detected in monitoring wells just south of Whittier Narrows Dam in the Central Basin. EPA intends to implement a remedy that will prevent further migration of contamination above drinking water standards into the Central Basin.

This Remedial Action Objective reflects EPA's regulatory goal of restoring usable groundwater to its beneficial uses wherever practicable, within a time frame that is reasonable, or, if restoration is deemed impracticable, to prevent further migration of the plume, prevent exposure to the contaminated groundwater, and evaluate further risk reduction (40 Code of Federal Regulations Section 300.430[a][1][iii][F]).

To meet the Remedial Action Objective, migration control will be required in the Whittier Narrows Operable Unit as long as groundwater VOC concentrations moving through the Whittier Narrows exceed state or federal drinking water standards. The Remedial Action

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Figure 2: Shallow VOC Contamination

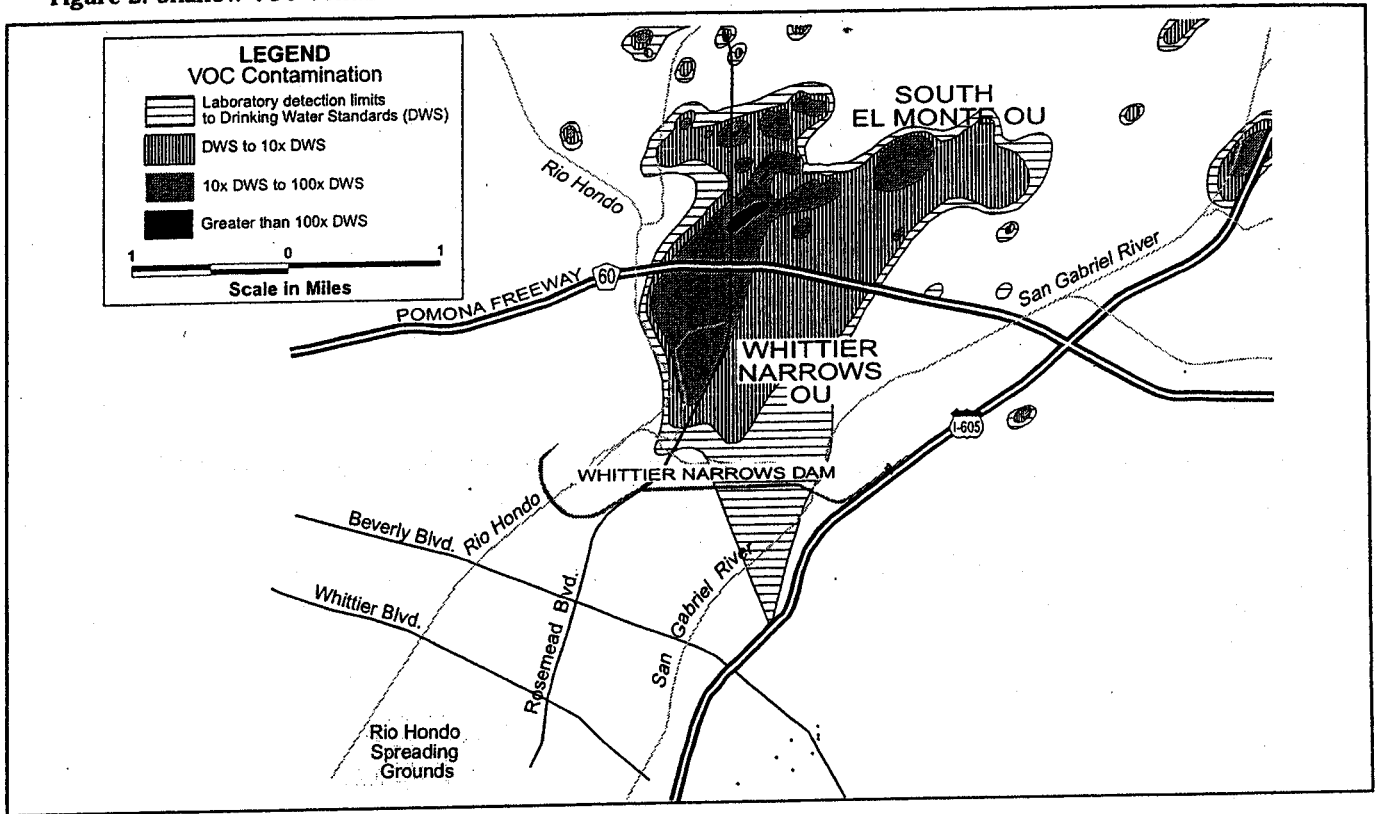
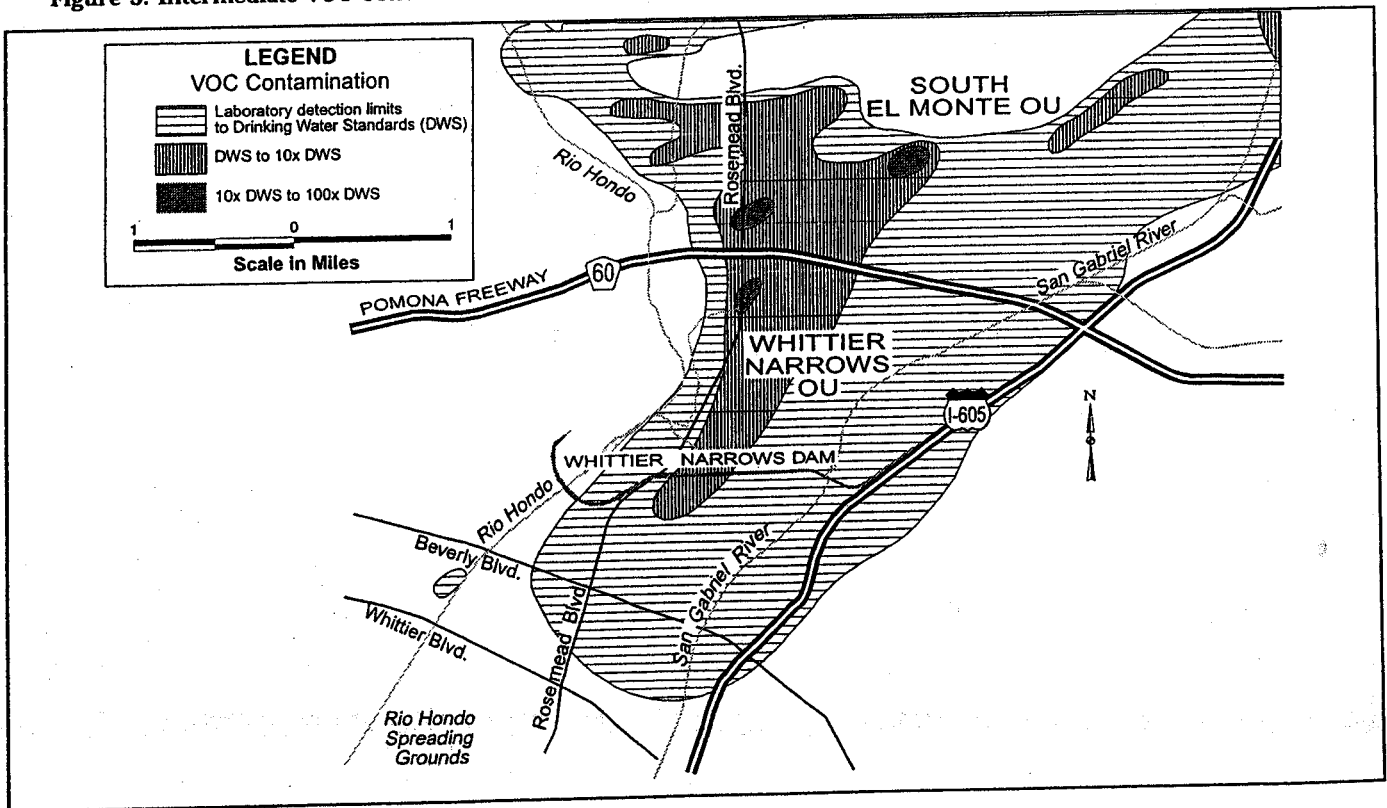


Figure 3: Intermediate VOC Contamination



Objective does not include a specific time frame for restoration of the aquifer because the Whittier Narrows remedial action does not address the sources of contamination, which are located in upgradient areas. Remediation in upgradient Operable Units will determine the length of time that an action in Whittier Narrows will need to operate.

SUMMARY OF CLEANUP ALTERNATIVES

EPA is considering two alternatives: Alternative 1, "No-Additional-Action" and Alternative 2, "Groundwater Containment near Whittier Narrows Dam". EPA typically considers several alternatives other than the No-Action-Alternative. In this case, only one active alternative was considered that would meet the Remedial Action Objective. This alternative is to extract and treat groundwater that exceeds drinking water standards and to conduct this extraction near Whittier Narrows Dam. Groundwater contamination containment options other than extraction were not considered because the existence of significant contamination to depths of 400 feet precludes other technologies.

EPA considers the area near the dam as the only suitable location for extraction because the much of the groundwater north of Whittier Narrows Dam is contaminated and the groundwater south of the dam has remained relatively clean. If EPA located groundwater extraction too far north of the dam, contamination present south of the extraction wells would eventually move into the Central Basin. On the other hand, locating the extraction too far south of the dam, beyond the current extent of contamination, would allow the contamination to spread over a much larger area, including portions of the Central Basin. By locating the extraction near the dam, EPA can best control contaminant migration, reduce risks from potential exposure to the contaminated groundwater, and protect the area's groundwater resource.

The two alternatives are evaluated against eight of the nine specific criteria established by the National Contingency Plan (see Figure 4). Evaluation of the community acceptance criterion will be conducted based on comments received during the public comment period.

ALTERNATIVE 1 - NO ADDITIONAL ACTION

- PRESENT WORTH COST ESTIMATE: \$2.6 MILLION
- ANNUAL OPERATION AND MAINTENANCE ("O&M") COST ESTIMATE: \$170,000

EPA is required to consider a no action alternative and to evaluate the risk to the public if no action were taken. The no action alternative serves as a basis for comparison with the other remedial alternative under consideration. In this

alternative, no additional remedial actions would be taken to control migration of contaminants in the Whittier Narrows Operable Unit. This alternative is titled "No-Additional-Action", rather than "No Action", because it would include ongoing groundwater monitoring in accordance with the current Record of Decision, but would not include groundwater containment or treatment. The only costs associated with this alternative are for long-term groundwater monitoring. While it is unclear how long groundwater monitoring would be needed, for cost estimating purposes, EPA assumed monitoring would be needed for the next 30 years. The No-Additional-Action alternative does not meet the Remedial Action Objective for Whittier Narrows, does not comply with federal and state environmental statutes, and provides the least overall protection of human health and the environment.

EPA'S PREFERRED ALTERNATIVE

ALTERNATIVE 2 - GROUNDWATER CONTAINMENT NEAR WHITTIER NARROWS DAM

- PRESENT WORTH COST ESTIMATE: \$16.4 TO \$19.7 MILLION
- CAPITAL COST ESTIMATE: \$6.6 TO \$9.7 MILLION
- ANNUAL O&M COST ESTIMATE: \$610,000

EPA's preferred alternative incorporates extraction of contaminated water in the shallow and intermediate groundwater zones in the vicinity of Whittier Narrows Dam to provide containment of contaminated water migrating through Whittier Narrows. The extracted water will be treated and discharged. This alternative also includes a continued groundwater monitoring program in the Whittier Narrows area to ensure that the remedy is meeting the Remedial Action Objective.

EPA intends for the remedy to contain groundwater flow only in those portions of the aquifer where VOC concentrations exceed drinking water standards. The remedy will also be designed to minimize the potential impact of contamination on production wells near Whittier Narrows Dam. As shown in Figures 2 and 3, the size of the contaminated areas varies between the shallow and the intermediate zone. To facilitate cost-effective operations, the remedy will be designed with separate shallow and intermediate extraction wells, potentially in different locations, to allow for focused containment of only the contaminated portions of each depth interval. To develop cost estimates, specific extraction, treatment, and discharge systems were assumed. However, the selected remedy will incorporate an approach that provides flexibility during implementation of the remedial action.

The actual locations of the wells and magnitude of extraction

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SELECTING A REMEDY

Figure 4: The EPA uses nine criteria to evaluate alternatives for addressing contamination at a hazardous waste site.



will be determined during remedial design based on further understanding of the extent of groundwater contamination and water end-use and water rights considerations. EPA will evaluate a variety of implementation scenarios during remedial design, then select the most cost-effective approach that meets the Remedial Action Objective.

Once the extracted groundwater has been treated to remove VOCs, the treated water will meet or exceed drinking water standards and other ARARs for all constituents. The preferred alternative assumes that the treatment system would consist of air stripping with carbon adsorption for VOCs in the off-gas. However, other common treatment technologies, such as liquid-phase carbon adsorption, are also available. A single treatment facility has been assumed for costing purposes. After determination of the final extraction locations, extraction rates, and the end-use for the treated water, EPA will evaluate whether it would be more cost-effective to have multiple treatment facilities.

If the necessary agreements can be reached, the treated water will be supplied to cities or water purveyors that provide drinking water to residents and businesses in the San Gabriel and/or Central Basins. These water purveyors would then reduce extraction from their production wells by an equivalent amount. This end-use option represents the greatest beneficial use for the treated water and can provide a supply of clean water to purveyors whose wells may be impacted or threatened by groundwater contamination. Alternatively, if necessary agreements cannot be reached with water purveyors and water management agencies, or if it appears to be more cost-effective, the treated water will be recharged to the aquifer. This would likely occur via recharge facilities along the San Gabriel River and Rio Hondo in the Montebello Forebay. The final end use will be selected during remedial design.

A range of estimated costs is presented above for the preferred alternative to encompass different potential extraction locations and different end-use scenarios. The estimated total cost of the alternative is based on an assumed 30-year project life. The actual length of time that the extraction will need to occur depends on how much contamination moves into the groundwater from upgradient sources and how quickly contaminants move through the aquifer.

Aggressive remedial actions in the upgradient South El Monte Operable Unit would likely result in lower treatment and operation costs for the Whittier Narrows remedy by: 1) reducing the amount of time the remedy would need to operate, 2) reducing VOC concentrations reaching the extraction wells, and, 3) reducing the size of the contaminated area requiring containment.

If EPA selects Alternative 2 in the Record of Decision, design of the remedy would begin immediately and take about a year to complete. Construction of extraction wells, pipelines and treatment facilities would begin shortly thereafter and be completed approximately a year later.

EVALUATION OF ALTERNATIVES

Based on EPA's evaluation of the two alternatives against eight of the nine criteria (see Table below), EPA prefers Alternative 2.

ALTERNATIVE 1 - THE NO ADDITIONAL ACTION ALTERNATIVE

The No-Additional-Action Alternative allows continued expansion of the area where groundwater contamination exceeds drinking water standards. As a result it does not meet most of the eight criteria. In addition, it does not meet EPA's Remedial Action Objective for the Whittier Narrows Operable Unit. However, because Alternative 1 requires only groundwater monitoring, it costs much less than Alternative 2.

ALTERNATIVE 2 - GROUNDWATER CONTAINMENT NEAR WHITTIER NARROWS DAM

Based on the information currently available, EPA believes that the preferred alternative, Alternative 2, best satisfies the requirements stated in the following eight evaluation criteria:

- **OVERALL PROTECTIVENESS OF HUMAN HEALTH AND THE ENVIRONMENT**

Alternative 2 satisfies this criteria by requiring the removal of groundwater contamination above drinking water standards from the aquifer to ensure protection of drinking water production wells and the groundwater resource in the Central Basin and Whittier Narrows. Extracted water will be treated to meet drinking water standards before it is sent to water purveyors or recharged to the aquifer.

- **COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)**

Alternative 2 meets all legally applicable or relevant and appropriate federal and state requirements, standards, criteria, and limitations.

- **LONG-TERM EFFECTIVENESS AND PERMANENCE**

The preferred remedy is designed to contain all groundwater moving through Whittier Narrows exceeding drinking water standards and is designed to operate as long as is needed to accomplish this goal.

- **REDUCTION OF TOXICITY, MOBILITY OR VOLUME THROUGH TREATMENT**

Under Alternative 2, contaminated groundwater will be extracted and transported to a treatment facility. At the treatment facility contaminants present in the groundwater will be removed from the groundwater, collected in carbon vessels, and shipped to a processing facility for eventual destruction.

- **SHORT-TERM EFFECTIVENESS**

The remedy proposed in Alternative 2 will take approximately 2 years to implement. The process of constructing extraction wells, pipelines, and treatment facilities should be minimally disruptive to the public and environment.

- **IMPLEMENTABILITY**

The extraction and treatment technologies described in Alternative 2 are widely used and easily implementable. There are several feasible options for disposal of treated water including sale to local purveyors or recharge back into the aquifer.

- **COST**

The cost of the preferred remedy is reasonable. The Central Basin aquifer immediately downgradient of Whittier Narrows serves as the primary source of drinking water for millions of residents. If no action were taken a significant number of water purveyors may eventually be required to install wellhead treatment facilities on individual wells.

- **STATE ACCEPTANCE**

The Los Angeles Regional Water Quality Control Board concurs with EPA's recommendation to implement Alternative 2. The California Department of Toxic Substance Control is reviewing EPA's Plan.

In summary, EPA expects the Alternative 2 to meet the statutory requirement in CERCLA section 121(b) to: 1) be protective of human health and the environment; 2) comply with state and federal ARARs; 3) be cost-effective; 4) utilize permanent solutions and alternative treatment technologies to the maximum extent practicable; and 5) satisfy the preference for treatment as a principal element.

TABLE 1: COMPARISON OF ALTERNATIVES

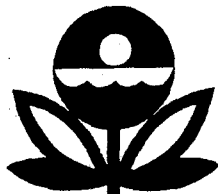
EVALUATION CRITERIA	ALTERNATIVE 1: NO ADDITIONAL ACTION	EPA'S PREFERENCE - ALTERNATIVE 2: GROUNDWATER CONTAINMENT
OVERALL PROTECTIVENESS	NOT PROTECTIVE	PROTECTIVE
COMPLIANCE WITH STATE AND FEDERAL REQUIREMENTS	DOES NOT COMPLY	COMPLIES
LONG-TERM EFFECTIVENESS	NOT EFFECTIVE	EFFECTIVE
IMPLEMENTABILITY	NOT APPLICABLE	FEASIBLE
SHORT-TERM EFFECTIVENESS	NOT APPLICABLE	EFFECTIVE
REDUCTION OF TOXICITY, MOBILITY OR VOLUME BY TREATMENT	NO REDUCTION	HAZARDOUS CONTAMINANTS REDUCED
PRESENT WORTH COST	\$2.6 MILLION	\$16.4 TO \$19.7 MILLION
STATE AGENCY ACCEPTANCE	LARWQCB CONCURS WITH EPA'S PREFERRED ALTERNATIVE. DTSC IS REVIEWING THE PROPOSED PLAN.	
COMMUNITY ACCEPTANCE	COMMUNITY ACCEPTANCE OF THE PREFERRED ALTERNATIVE WILL BE EVALUATED AFTER THE PUBLIC COMMENT PERIOD	

14 Documentation of Significant Changes

The Proposed Plan for the WNOU was released for public comment in October 1998. The Proposed Plan identified Alternative 2: "Groundwater Containment Near Whittier Narrows Dam", as the Preferred Alternative for addressing groundwater contamination in Whittier Narrows. EPA reviewed written and verbal comments submitted during the public comment period. It was determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary.

APPENDIX I

**San Gabriel Valley Superfund Site / Puente Valley Operable Unit
Proposed Plan
USEPA, Region 9
January 1998**



San Gabriel Valley Superfund Site Puente Valley Operable Unit Proposed Plan

U.S. ENVIRONMENTAL PROTECTION AGENCY • REGION 9 • SAN FRANCISCO, CALIFORNIA

EPA PROPOSES PLAN TO ADDRESS GROUND-WATER CONTAMINATION AT PUENTE VALLEY OPERABLE UNIT

INTRODUCTION

This fact sheet is the U. S. Environmental Protection Agency's (EPA's) Proposed Plan for the Puente Valley Operable Unit (PVOU) of the San Gabriel Valley Superfund Site in Los Angeles County, California. This Proposed Plan presents four alternatives, including EPA's preferred alternative, for addressing ground-water contamination at the site. In accordance with section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, the EPA announces a proposed plan to solicit public review and comment. EPA encourages members of the public to review and comment on the alternatives described in this Proposed Plan during the public comment

period (January 15 to February 14, 1998). This Proposed Plan summarizes the more detailed information found in the Puente Valley Operable Unit Interim Remedial Investigation/Feasibility Study (RI/FS) report and other documents in the Administrative Record. These documents are available for review at the information repositories listed on page 9. EPA encourages the public to review these documents to gain a more comprehensive understanding of the PVOU and the associated Superfund activities.

A community meeting will be held on Wednesday, January 28 to discuss the alternatives presented in this plan and to take comments on the Proposed Plan (see box for details).

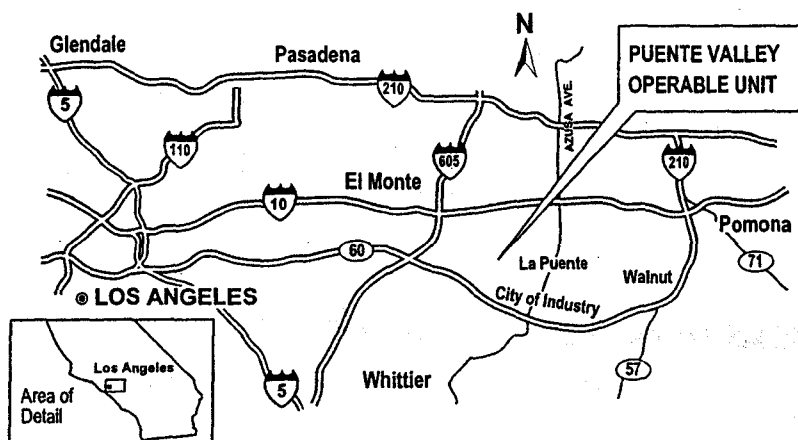


Figure 1: Location map of Puente Valley Operable Unit

COMMUNITY MEETING

Regarding the Proposed Plan for
the San Gabriel Valley Superfund
Site Puente Valley Operable Unit

Wednesday, January 28, 1998

7:00 to 9:00 p.m.

La Puente High School
15615 E. Nelson Avenue
(at Hacienda Blvd.)
La Puente, CA

At this meeting, EPA representatives will describe the alternatives evaluated and present EPA's preferred alternative. Community members will have the opportunity to ask questions, and give written and verbal comments on all the alternatives described in the Proposed Plan and other site-related Superfund documents. EPA encourages comments on the Proposed Plan and other site-related Superfund documents during the public comment period (January 15 to February 14, 1998). Comments may be submitted orally or in writing at the community meeting or by mail, fax, or e-mail to:

Loren E. Henning
Remedial Project Manager
U.S. EPA Region 9
75 Hawthorne Street (SFD-7-3)
San Francisco, CA 94105
Fax: (415) 744-1796
e-mail:
henning.loren@epamail.epa.gov

*Note: Comments sent by mail must be postmarked no later than February 14, 1998. Comments sent by fax or e-mail must be received no later than February 14, 1998.

EPA's objective is to protect human health and the environment. For the PVOU, EPA has evaluated interim remedial alternatives to contain the spread of ground-water contamination. After evaluating the alternatives, EPA is proposing to extract, treat and contain contaminated ground water in the shallow and intermediate zones at the mouth of Puente Valley to prevent further migration of existing ground-water contamination. In addition, EPA proposes ground-water monitoring in the shallow, intermediate, and deep zones at mid-valley (near Hacienda Boulevard) and at the mouth of the valley.

As the lead agency for the PVOU, EPA has worked with the Los Angeles Regional Water Quality Control Board (LARWQCB) and the California Department of Toxic Substances Control (DTSC) on this site. Both the LARWQCB and the DTSC concur with EPA's preferred alternative. After the public comment period EPA, in consultation with the DTSC and the LARWQCB, will select one of the alternatives presented in this Plan. EPA will then summarize the alternative selected in the interim Record of Decision (ROD) for the PVOU.

Public input on all alternatives, and on the information that supports the alternatives, is an important contribution to the remedy selection process. The public is encouraged to comment; these comments can influence EPA's decision. The interim remedy chosen could differ from EPA's preferred alternative, if warranted, because of new information or public comments that EPA receives.

SITE DESCRIPTION

The PVOU is part of the San Gabriel Valley Superfund Site located in eastern Los Angeles County, California (see Figure 1 on page 1). The term "Operable Unit" is used to define a discrete action that is an incremental step toward a comprehensive site remedy. Operable units may address certain geographic areas, specific site problems, initial phases of a remedy, or a set of actions over time.

The San Gabriel Valley encompasses a basin that is approximately 170 square miles. Ground water in the San Gabriel basin is the primary drinking water source for more than one million people. Regional ground-water contamination by volatile organic compounds (VOCs) prompted EPA to place the San Gabriel Valley on the National Priorities List (NPL) in 1984. This list identifies the highest priority hazardous waste sites in the United States for investigation and cleanup.

Ground water from the San Gabriel Valley flows into the Central Basin to the south and southwest through the Whittier Narrows. The potential migration of contamination from the San Gabriel Basin into the Central

Basin could affect the water supply of the Los Angeles metropolitan area.

The majority of the PVOU is highly industrialized and is occupied by the City of Industry, an incorporated city that covers approximately 11 square miles. Approximately 96 percent of the city is zoned for industrial purposes, the rest is zoned for commercial purposes. Nearly 85% of the land within the boundaries of the City of Industry has been developed, and accommodates approximately 1,700 businesses. Future development plans will likely be for industrial and commercial uses.

A small amount of land within the City of Industry is allotted for residential purposes and is occupied by approximately 631 residents. The cities of La Puente and Walnut also occupy portions of the PVOU. These portions are zoned primarily for residential purposes and are likely to remain residential.

All aquifers (shallow, intermediate, and deep) in the PVOU are considered to be municipal water sources by the State of California. VOCs are the primary organic contaminants found in the PVOU above EPA Maximum Contaminant Levels (MCLs). Tetrachloroethene (PCE) and Trichloroethene (TCE) are the VOCs that have been detected most often in ground water, although 1,1 Dichloroethane, 1,1 Dichloroethene, 1,2 Dichloroethene, and 1,1,1 Trichloroethane have also been detected above MCLs in the PVOU.

Sources of the ground-water contamination include firms engaged in metal cleaning, coating and manufacturing, chemical product manufacturing, plastics, aerosols, electric component manufacturing, printing, rubber manufacturing, die casting and engineering. In general, VOC concentrations are highest in the shallow ground water beneath facility source areas where releases have occurred. VOCs have also spread to the intermediate zone and portions of the deep zone as a result of downward hydraulic gradients. In order to address these sources of ground-water contamination, the LARWQCB, under a grant from EPA, oversees investigations and cleanups at facilities where releases have occurred. Figures 2 and 3 show 1996 VOC concentrations in the shallow and intermediate zones.

ASSESSMENT OF HEALTH RISK

In 1994, EPA completed a baseline risk assessment for the PVOU. The purpose of the risk assessment was to evaluate potential health effects from exposure to contaminated ground water. The results of the risk assessment helped EPA determine if any remedial actions would be necessary to protect human health or the

Figure 2: 1996 VOC Concentrations in Shallow Zone

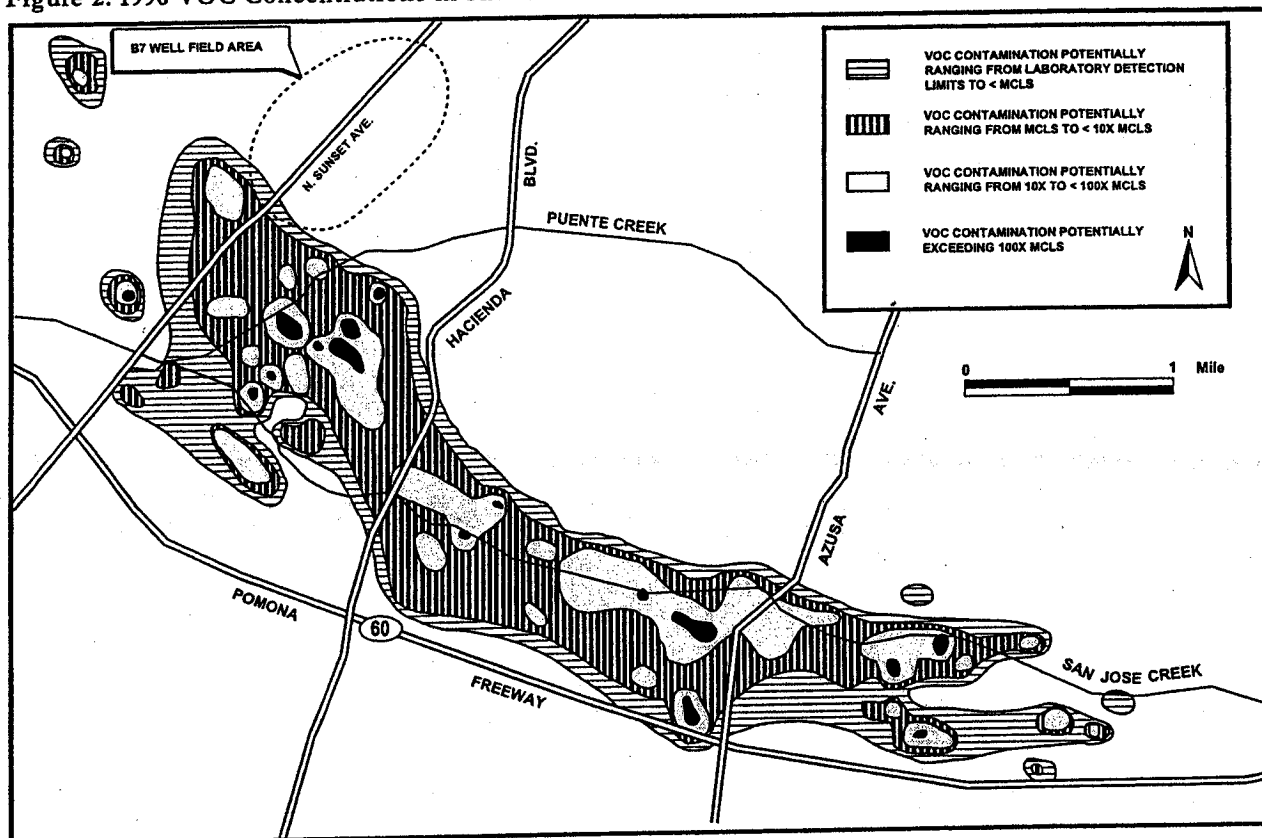
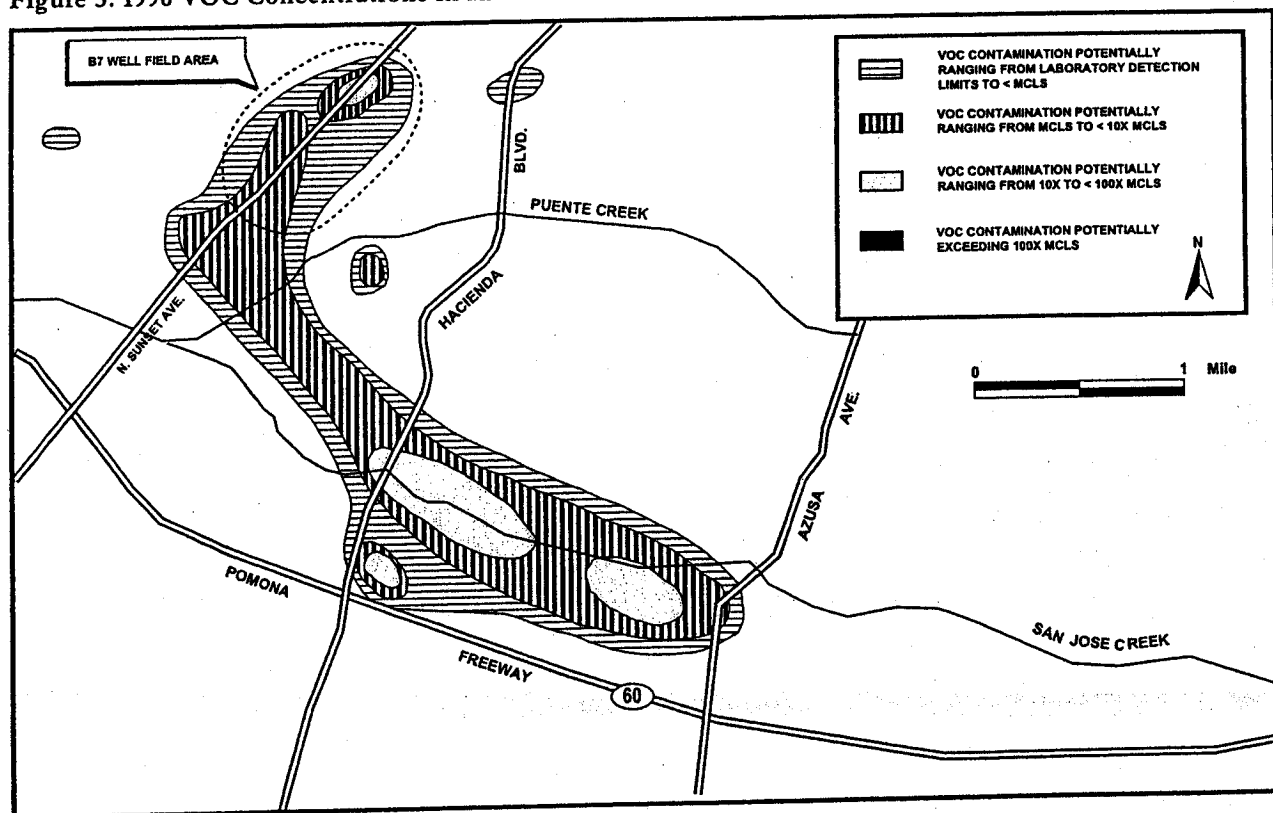


Figure 3: 1996 VOC Concentrations in Intermediate Zone



environment. The risk assessment process includes:

a) identifying chemicals present in the ground water; b) characterizing the population potentially exposed to these contaminants; and c) evaluating the potential health effects resulting from exposure to the contaminated ground water. EPA evaluated how individuals might be exposed to these contaminants under both current and future conditions, and potential risks to natural resources.

As part of the risk assessment, EPA evaluated three scenarios in which individuals might be exposed to the contaminated ground water:

- 1) potential for a current resident to be exposed to ground water through domestic use;
- 2) potential for a future resident to be exposed to contamination in ground water through domestic use; and
- 3) potential for current and future workers and residents to be exposed to contamination in ground water through transport of VOCs from ground water through the foundation of a building.

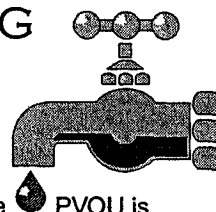
EPA uses a "target risk range" of one person in ten thousand (10^{-4}) to one person in one million (10^{-6}) getting cancer from the contamination at the site. Risks that fall within or below this range are acceptable and therefore generally do not warrant remedial action. Risks greater than one in ten thousand (10^{-4}) generally warrant remedial action. The results of the baseline risk assessment indicated that the potential for a future resident to be exposed to ground-water contamination through domestic use resulted in a total estimated excess lifetime cancer risk of five in one thousand (5×10^{-3}). This risk, estimated as the "reasonable maximum exposure" (the highest exposure that is reasonably expected to occur at the site), warrants action at the site.

EPA also evaluated how the environment, including plants and wildlife, might be exposed to, and impacted by contaminated ground water. Eight VOCs were detected in surface water in San Jose Creek, however, the VOCs are removed from surface water primarily by evaporation to the atmosphere. The VOCs are not expected to bioconcentrate in aquatic life or adhere to sediment, and therefore no adverse impact to aquatic life is predicted.

EPA is expected to address "principal threats" posed by a site. A principal threat is one that is highly toxic or highly mobile and would present a significant risk to human health and the environment. The principal threat identified for the PVOU is the possibility that Dense Non-Aqueous Phase Liquids (DNAPLs) are present in the ground water. DNAPLs are contaminants, such as PCE and TCE, that are denser than water. After release on the

IS MY DRINKING WATER SAFE?

Yes! Although ground-water contamination has occurred, municipal drinking water from the PVOU is treated by the water purveyors to meet all State and Federal drinking water standards.



surface, DNAPLs sink and may accumulate in pockets in the subsurface. DNAPLs generally are extremely difficult to remove from ground water and because the contaminants dissolve very slowly, may act as a continuing source of ground-water contamination. Although DNAPLs have not been observed in any of the deep monitoring wells installed during the Remedial Investigation, high concentrations of the contaminant PCE detected in some areas suggest the possible presence of DNAPLs.

Actual or threatened releases of hazardous substances from this site, if not addressed by the preferred alternative or one of the other active measures considered, may present a current or potential threat to public health, welfare, or the environment.

SUMMARY OF ALTERNATIVES

EPA's Remedial Action Objectives (RAOs) for the PVOU are:

- 1) to prevent exposure of the public to contaminated ground water;
- 2) to inhibit contaminant migration from the more highly contaminated portions of the aquifer to the less contaminated areas or depths;
- 3) to reduce the impact of continued contaminant migration on downgradient water supply wells; and
- 4) to protect future uses of less contaminated and uncontaminated areas.

These RAOs reflect EPA's regulatory goal of restoring usable ground waters to their beneficial uses wherever practicable, within a time frame that is reasonable, or, if restoration is deemed impracticable, to prevent further migration of the plume, prevent exposure to the contaminated ground water, and evaluate further risk reduction (40 CFR Section 300.430(a)(1)(iii)(F)).

The RAOs for the PVOU do not include numeric,

Table 1: Comparison of Alternatives

ALTERNATIVE EVALUATION TABLE				
Evaluation Criteria	Alternative 1 No action	Alternative 2 Ground-water monitoring	Alternative 3 (EPA's preferred alternative) Ground-water control in the shallow and intermediate zones at the mouth of the valley and ground-water monitoring	Alternative 4 Ground-water control in the shallow and intermediate zones at the mouth of the valley, in the intermediate zone at mid-valley, and ground-water monitoring
Overall Protectiveness	⊗	⊗	●	●
Compliance with State and Federal Requirements	⊗	⊗	●	●
Long-term Effectiveness	⊗	⊗	●	●
Reduction of Toxicity, Mobility or Volume by Treatment	⊗	⊗	●	●
Short-term Effectiveness	Not applicable	○	●	●
Implementability	Not applicable	●	○	○
Present Worth Cost	\$0	\$7.88 million	\$27.80 million	\$36.87 million
State Agency Acceptance	DTSC and the LARWQCB concur with EPA's preferred alternative.			
Community Acceptance	Community acceptance for the recommended alternative will be evaluated after the public comment period.			

⊗ Does not meet criterion ○ Partially meets criterion ● Fully meets criterion

SELECTING A REMEDY

THE U.S. EPA USES NINE CRITERIA TO EVALUATE ALTERNATIVES FOR ADDRESSING CONTAMINATION AT A HAZARDOUS WASTE SITE.

THEY ARE:



REMEDY

chemical-specific objectives in the aquifer or a time frame for restoration because this is an interim action. They do include VOC "mass removal" as a secondary objective. EPA's preferred alternative will remove significant contaminant mass from the aquifer, in effect beginning the restoration process, but it will be designed for migration control rather than mass removal.

EPA considered several alternatives to reduce risk from potential exposure to the contaminated ground water. In the evaluation of these alternatives for selection as the preferred alternative, EPA used nine specific criteria: overall protection of human health and the environment; compliance with State and Federal requirements; long-term effectiveness; reduction of toxicity, mobility, or volume by treatment; short-term effectiveness; implementability; cost; state acceptance; and community acceptance (see page 6).

Alternative 1 - No Action

Present Worth Cost Estimate: \$0

Annual Operation and Maintenance ("O&M") Cost Estimate: \$0

EPA is required to consider a no action alternative and to evaluate the risk to the public if no action were taken. In this alternative, no remedial actions are taken to control migration of contaminants from or within the Puente Valley area. This alternative does not include any ground-water monitoring, extraction, or treatment. There is no cost associated with this alternative and it would provide the least overall protection of human health and the environment.

Alternative 2 - Ground-water Monitoring

Present Worth Cost Estimate: \$7.88 million

Annual O&M Cost Estimate: \$0.36 million

The only remedial action incorporated into this alternative is ground-water monitoring. The alternative would rely on natural attenuation mechanisms such as dilution and dispersion to address contaminant migration. Alternative 2 does not have any ground-water containment, extraction, treatment, conveyance, or discharge components. This alternative includes installing a monitoring system to monitor compliance with the RAOs and performance criteria in the shallow, intermediate, and deep zones at mid-valley and the mouth of Puente Valley. A total of 16 new wells would be installed, including four new wells downgradient of mid-valley, in the intermediate and deep zones, and 12 new wells near the mouth of the valley, in the shallow and intermediate zones.

EPA'S PREFERRED ALTERNATIVE

Alternative 3 - Ground-water Control in the Shallow and Intermediate Zones at the Mouth of Puente Valley and Ground-water Monitoring

Present Worth Cost Estimate: \$27.80 million

Annual O&M Cost Estimate: \$1.27 million

This alternative includes extraction, containment and treatment of contaminated ground water in the shallow and intermediate zones at the mouth of Puente Valley. In addition, this alternative includes a ground-water monitoring system to monitor compliance with RAOs and performance criteria in the shallow, intermediate and deep zones at mid-valley and the mouth of the valley. In order to develop cost estimates for the Feasibility Study, additional extraction and treatment systems were assumed for both the intermediate and shallow zones. This alternative incorporates a performance-based approach which specifies criteria that must be met while providing flexibility in implementation.

For example, in the intermediate zone, this alternative provides the option of either installing a series of extraction wells, or using an existing well field extraction system to provide containment of the intermediate zone at the mouth of the valley. EPA proposes the following performance criteria for the intermediate zone: "the remedial action shall provide sufficient hydraulic control, through ground-water extraction, to capture ground water contaminated with VOCs above MCLs, and prevent it from migrating into or beyond the B7 well field area (depending on the location of extraction)."

For the shallow zone, this alternative requires either the installation of an extraction and treatment system or, if possible, demonstration through monitoring that natural attenuation is currently containing the shallow ground-water contamination. For the shallow zone, EPA proposes the following performance criteria: "the remedial action shall apply measures necessary to prevent further migration of ground water in the shallow zone with VOC contamination above MCLs (or possibly a multiple of MCLs) from migrating beyond its current lateral and vertical extent. (Migration shall not occur beyond a specified buffer zone)."

Extracted ground water will be treated to remove VOCs before being discharged to either San Jose Creek or to a municipal water supply system. This alternative assumes a treatment system consisting of air stripping and adsorption of VOCs in the off-gas. The cost estimate for this alternative included the construction of a

single, centralized treatment plant near the mouth of the valley. The present worth cost of this alternative is \$27.8 million. However, it may be necessary to treat the extracted ground water to reduce concentrations of Total Dissolved Solids (TDS), certain metals and/or nitrate as required by the State of California. For cost estimating purposes, a reverse osmosis membrane separation process was assumed to address TDS, metals and/or nitrate. The present worth cost of this alternative with the use of reverse osmosis treatment is \$51.6 million. The LARWQCB has indicated that it may be possible to obtain a waiver from the requirement to treat the extracted ground water for TDS, metals and/or nitrates. EPA strongly supports the use of a treatment waiver to reduce cost associated with this alternative.

Alternative 4 - Ground-water Control in the Shallow and Intermediate Zones at the Mouth of Puente Valley and in the Intermediate Zone at Mid-Valley and Ground-water Monitoring

Present Worth Cost Estimate: \$36.87 million

Annual O&M Cost Estimate: \$1.63 million

This alternative includes all of the components of Alternative 3, plus ground-water extraction and treatment in the intermediate zone at mid-valley. The additional extraction is intended to address horizontal and vertical migration of contamination in the intermediate zone. This alternative would prevent the vertical migration of

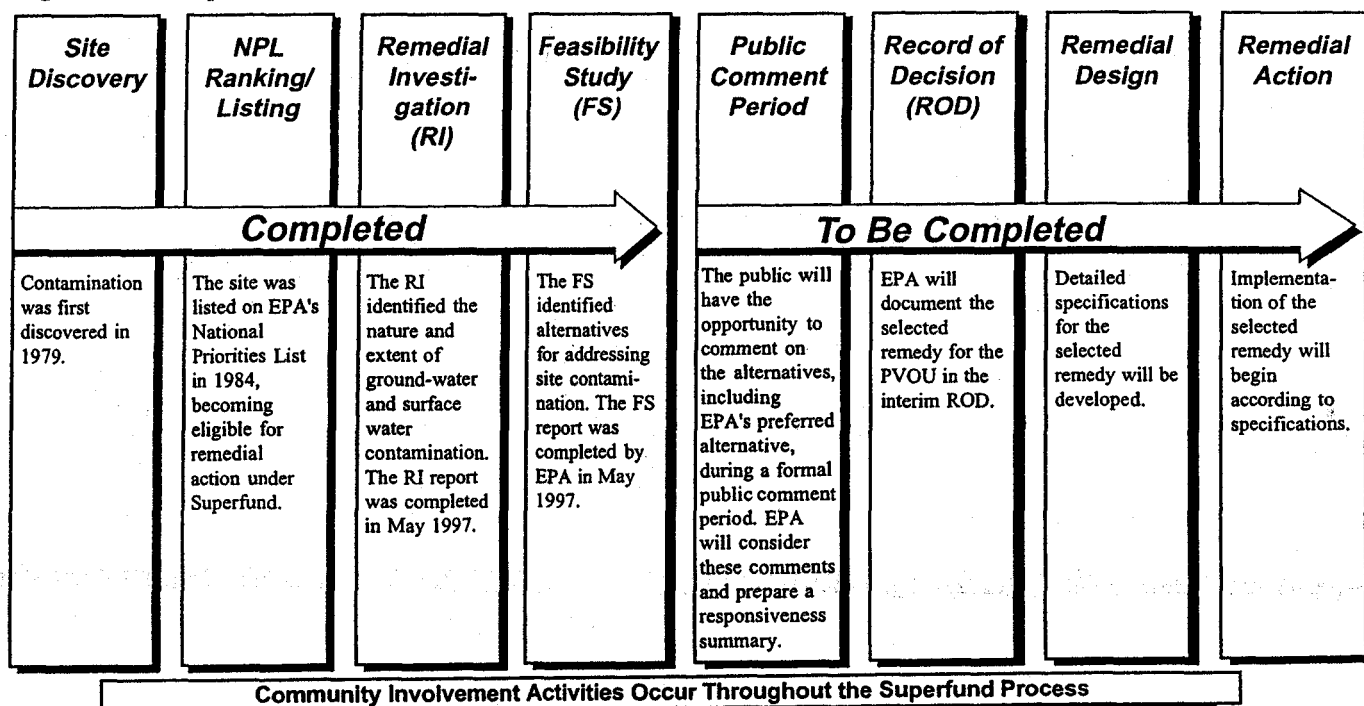
contamination into the deep zone downgradient of mid-valley which is currently uncontaminated. The additional extraction would also prevent the horizontal migration of contamination into the currently uncontaminated portions of the intermediate aquifer. Performance criteria for ground-water control in the shallow and intermediate zones at the mouth of the valley would be the same as those proposed for Alternative 3. Alternative 4 adds a performance criterion for the intermediate zone at mid-valley: "the remedial action shall protect water quality in the intermediate and deep zones downgradient of the mid-valley location from becoming more contaminated."

As described in Alternative 3, this alternative includes treatment of extracted ground water for VOCs before being discharged. The present worth cost estimate for this alternative without reverse osmosis treatment is \$36.87 million. If reverse osmosis treatment before discharge is required, the present worth cost estimate is \$68.1 million.

CONCLUSION

Based on EPA's evaluation of the alternatives against the nine criteria, EPA prefers Alternative 3. Alternatives 1 and 2 provide the least overall protection of human health and the environment and do not comply with State and Federal requirements. There are advantages to both Alternative 3 and Alternative 4, however in EPA's judgment, Alternative 3 is preferred because it meets all of the evaluation criteria at a lower cost. The RI/FS for the PVOU provides a more detailed evaluation of the alternatives with respect to the nine criteria. ■

Figure 4: The Superfund Process for the Puente Valley Operable Unit



APPENDIX J

**San Gabriel Valley Superfund Sites / Alhambra Operable Unit
USEPA, Region 9
September 2002**



San Gabriel Valley Superfund Sites, Area 3, September 2002

U.S. Environmental Protection Agency • Region 9 • San Francisco, California • September 2002

EPA to begin field work to investigate groundwater quality in Alhambra

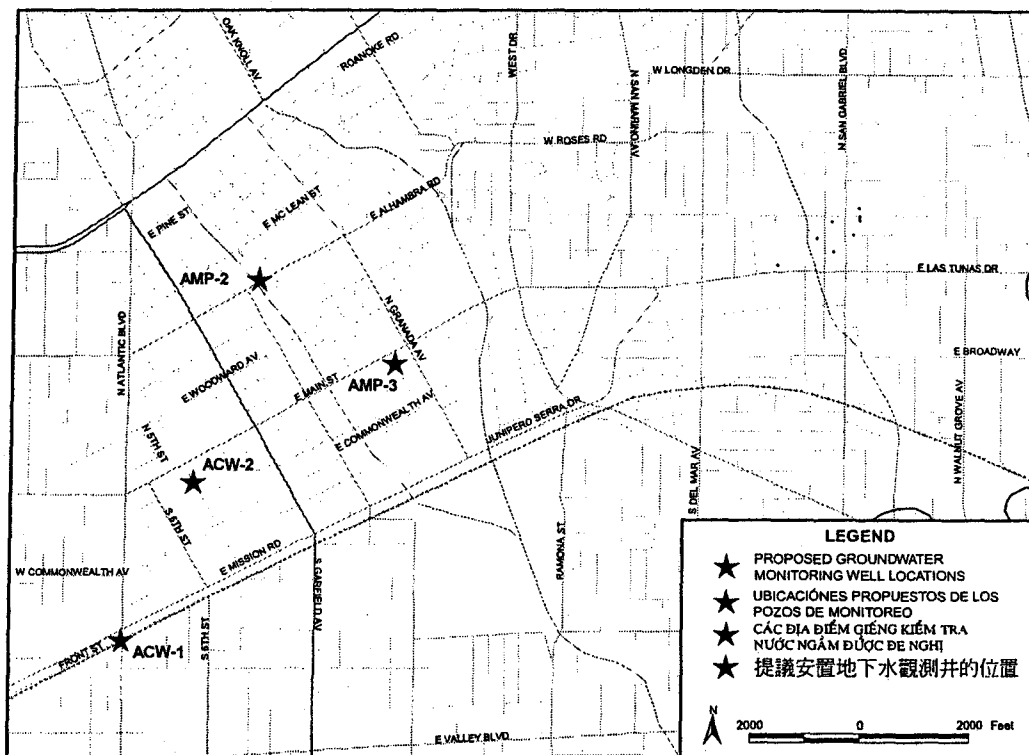
Monitoring is part of Superfund groundwater cleanup program

Figure 1: Planned Fieldwork - Locations of proposed groundwater monitoring wells

Figura 1: Planes de trabajo – Ubicaciones propuestos para los pozos de monitoreo del agua subterránea

Hình 1: Dự án làm việc tại công trường – Dự định Địa điểm các giếng nước kiểm tra thể chất nước ngầm (dưới lòng đất)

圖 1: 規劃的實地考察 - 提議安置地下水觀測井的位置



As part of its ongoing effort to investigate and clean up groundwater and to protect the public health in San Gabriel Valley, the U.S. Environmental Protection Agency will drill four wells this fall to study the extent of groundwater contamination in the Alhambra area. This project will not affect your drinking water or expose people living or working near the drilling sites to contaminated water or to hazardous chemicals. This fact sheet informs you of our planned activities and describes EPA's investigation and cleanup of groundwater contamination in Area 3 of the San Gabriel Valley Superfund sites, in the City of Alhambra and surrounding communities.

Continued on pg. 2

San Gabriel Valley Area 3 Groundwater Monitoring Well Installation Project

Work schedules. EPA plans to drill four wells in the City of Alhambra, one at a time on Front Street, Fourth Street, Cordova Street, and E. Alhambra Road (see Figure 1). Each well will take approximately three to four weeks to complete. The drilling crew will generally work between the hours of 7:00 am to 7:00 pm, but in order to finish the job as quickly as possible, may work up to 24 hours per day at times, primarily on weekends.

Staff and equipment on site. To ensure public safety, EPA will employ health-and safety-trained drilling technicians and the drilling sites will be patrolled during non-working hours. The four-person drilling crew will use a truck-mounted

Continued on pg. 9

Community Open House

EPA representatives will be available to answer questions and describe the Superfund process and the monitoring well installation project in more detail. Please come!

Thursday, October 3, 2002

6:30 - 8:30 pm

Alhambra City Hall, main lobby

111 South First Street, Alhambra

For More Information

EPA provides general information on the Superfund Program, as well as copies of fact sheets and technical documents on the San Gabriel Valley Operable Units, at the locations below.

Superfund Records Center
95 Hawthorne Street, Room 403 (SFD-7C)
San Francisco, CA 94105
(415) 536-2000

West Covina Library
1601 West Covina Parkway
West Covina, CA 91790
(626) 962-3541

Rosemead Library
8800 Valley Boulevard
Rosemead, CA 91770
(626) 573-5220

Information is also available on EPA's web sites at <http://www.epa.gov> (EPA Headquarters home page), <http://www.epa.gov/region09> (EPA Region 9 home page), and <http://yosemite.epa.gov/r9/sfund/overview.nsf/> (Superfund site overviews). Documents and Web pages are generally in English only.

Contacts

EPA cleanup work: Don Hodge, EPA Community Involvement Coordinator: (415) 972-3240
EPA Toll-free (English and Spanish) Community Involvement Office message line: (800) 231-3075
Vietnamese and Chinese: (626) 570-5011
Well installation: Ali Cayir, Alhambra City Engineer: (626) 570-3284
Media: Mark Merchant, EPA Southern California Press Officer: (415) 947-4297

From page 2

drilling rig to install the wells. To minimize disruption to the neighborhood, sound-reducing blankets will enclose the drilling location and safety barriers and traffic cones will ensure the safety of drivers, cyclists, pedestrians, and children (see photo, back page). EPA does not expect any disturbance from ground vibrations. Please contact us at the numbers listed on page 2 if you have any questions.

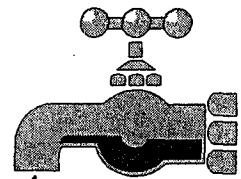
Results. EPA will take the first samples of groundwater from the new wells once the wells are completed and about every four months thereafter for at least two years. EPA will make the results of the groundwater sampling available to the public, along with other project documents, at the libraries listed on page 2.

Groundwater Contamination in the Valley

The Area 3 monitoring well project is part of a larger effort to protect the water supply of the San Gabriel Valley. The San Gabriel Basin aquifer provides approximately 90% of the domestic water supply for more than one million residents of the San Gabriel Valley. In 1984, widespread pollution of the underground water source by industrial chemicals prompted the United States Environmental Protection Agency (EPA) to add four areas in the San Gabriel Valley (Areas 1 through 4) to the National Priorities List of the country's most hazardous waste sites. Area 3 includes parts of the cities of Alhambra, San Gabriel, Temple City, San Marino, South Pasadena, and Rosemead. The groundwater contamination is the result of decades of handling and disposal practices which released volatile organic compounds, or VOCs, into the soil and groundwater. VOCs are commonly used in dry cleaning, paint stripping, metal plating, and machinery degreasing. Contaminants found in Area 3 include the VOCs trichloroethylene (TCE) and tetrachloroethylene (PCE).

Despite the contamination, water suppliers in the San Gabriel Valley continue to provide custom-

Is my drinking water safe?



Yes! All drinking water provided by water utilities in Alhambra and other San Gabriel Valley communities meets current Federal and State drinking water standards.

ers with clean water by shutting down wells in contaminated areas, treating water to remove contaminants, blending water to meet drinking water standards, and obtaining water from neighboring suppliers or utilities.

Area 3 Remedial Investigation and Feasibility Study

After adding the San Gabriel Valley sites to the National Priorities List, EPA began investigation efforts, called the Remedial Investigation/Feasibility Study (RI/FS), to determine the nature and extent of soil and groundwater contamination and the potential for harm to the public, to identify sources of contamination, to develop a basin-wide plan to set cleanup priorities, and to develop alternatives for cleaning up the contamination.

EPA began the RI/FS for Area 3 in 1999 and is currently searching for sources of contamination throughout the area. Several area businesses have completed soil gas testing and are beginning groundwater testing to determine the potential for contamination of groundwater beneath their facilities. The next step, as noted above, is to install groundwater monitoring wells to collect data to help assess the extent of the contamination and its relationship to suspected sources in the area. With the cooperation of the City of Alhambra, EPA is working to ensure the continued safety of the groundwater resource and to protect the public health in the San Gabriel Valley.

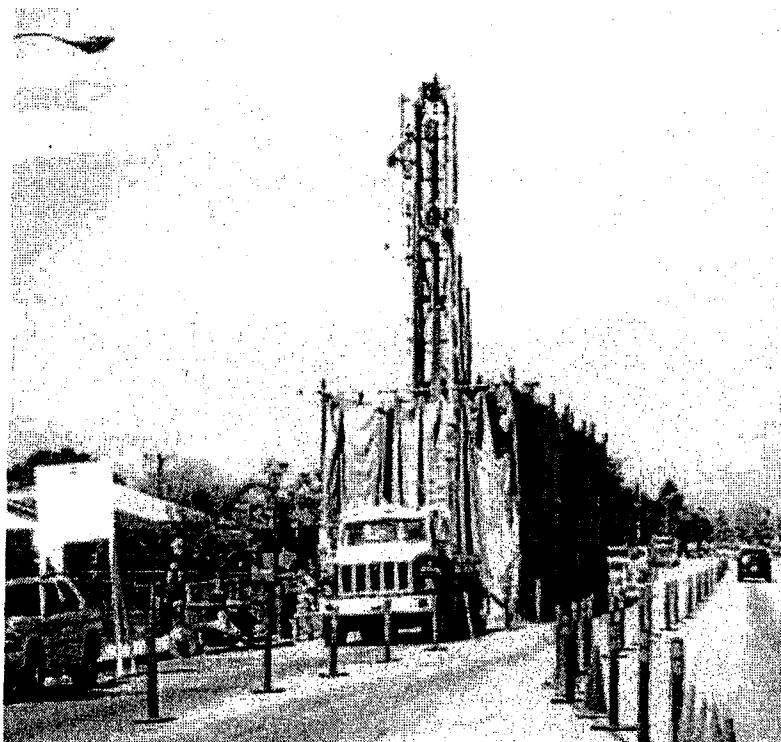


Figure 2: Typical Well Installation Site

Figura 2: Sitio Típico de Instalación de Pozo

Hình 2: Địa Điểm Đào Giếng Điển Hình

圖 2：典型的觀測井安置地點

Texto en español en las páginas 3 y 4

Bản dịch bằng tiếng Việt ở trang 5-6

中文翻譯請參見頁數 7-8

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75 Hawthorne Street (SFD-3)
San Francisco, CA 94105
Attn: Don Hodge

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TO:

FROM:

FAX#:

(213) 576-6717

ENCON:

Teri

Company:

Reference:

Attention:

Dixon Oriola

Date:

1/12/04

Subject:

Pages 4, including this sheet

If you do not receive all pages, please notify us as soon as possible.

Information:

Site maps and pages 6-8 of work
Plan.

Signed

Teri

Remedial Excavation Workplan

ENCON

Industrial Ovens

On October 1, 2003, ENCON advanced a total of fourteen (14) exploratory soil borings to confirm the presence of PCE impacted soil and delineate the vertical and lateral extent of VOC in the area of concern (AOC). The Site investigation activities were completed in accordance with the interim remedial action plan submitted and approved by the LARWQCB. A total of forty-two (42) soil samples were collected during the drilling activities and submitted for chemical analysis. Chemical analysis of soil samples results indicated that PCE was the only compound detected above laboratory reporting limits.

1.4.1 FURTHER SITE ASSESSMENT FINDINGS

The following findings were obtained from the subsurface soil and groundwater investigation data:

- 1) The highest levels of PCE were found to be present along the western property line (fence) at concentrations ranging between 112 ug/kg and 203 ug/kg. PCE concentrations were found to attenuate laterally to less than 25 ug/kg approximately 40 feet east of the property line (fence) and were non-detect approximately 100 feet from the fence. Based on data collected, the source of the contamination appears to increase towards the property line.
- 2) The AOC perimeter borings (EB1, EB2, EB3, EB6, EB7, and EB14) were found to be non-detect for samples collected at 5', 10' and 15' bgs.
- 3) The extent of the PCE impacted soil requiring remediation (50 ug/kg) is limited to an area measuring approximately 85' x 20'.
- 4) Depth to groundwater was found to range between 14.65 feet to 16.32 feet below the top of the well casings.
- 5) PCE was detected in groundwater at concentrations ranging between non-detect and 260.7 ug/l. The highest concentrations of PCE were reported in samples collected from the wells located along the property line (fence).
- 6) No elevated levels of Title 22 metals were found to be present in any of the soil samples selected for analysis.
- 7) Petroleum hydrocarbon compounds were not detected in the down gradient boring (EB1).

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1.4.2 FURTHER SITE ASSESSMENT CONCLUSIONS

The following conclusions were derived from the present (2003) and previous (1998) subsurface investigations performed at the former Industrial Oven AOC site.

- 1) The highest levels of PCE contamination appear to be present near the northwest property line adjacent to the former RAMCO - Ramser drum storage area. The Ramser property (former RAMCO facility) is located at 18525 Railroad Street and is topographically upgradient of the Site (former Industrial Oven property).
- 2) Impacts at the Site property may have been caused by surface releases of PCE which potentially migrated onto the Site property in the groundwater.
- 3) Based on the cleanup levels proposed to the LARWQCB (50 ug/kg), an area measuring 8' x 20' (1,700 sq. ft.) requires remediation.
- 4) Remedial excavation of impacted soil to a depth of 15 feet appears to be the best available remedial approach.

1.4.3 FURTHER SITE ASSESSMENT RECOMMENDATIONS

The following recommendations are provided for site remedial planning and design as well remedial approach for site closure and No Further Action status in the near future:

- 1) Because of the potential off-Site sources, ENCON does not consider VES a viable remedial option. In addition, groundwater pump and treat is also not recommended at the Site due to the potential upgradient sources.
- 2) It is ENCON's opinion that the best available clean-up technology is remedial excavation. Contaminated soil will be excavated and removed according to cleanup criteria proposed to the LARWQCB (PCE concentration of 50 ug/kg).
- 3) Contaminated soil will be excavated, characterized, and transported to a permitted TSD under proper manifests. In addition, a Soil Management Plan and a Health & Safety Plan will be prepared and implemented.
- 4) The excavation will be backfilled with clean imported soil and compacted to >90% under the supervision of a soils engineer.
- 5) Concerning the groundwater cleanup, a Cash-Out Settlement will be made and finalized with Puente Operable Unit, Northrop - Grumman/TRW.

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1.5 CLEANUP LIMITATIONS

ENCON is prepared to initiate a cleanup effort to remediate VOC (PCE) impacted soil on the Industrial Oven Site, specifically in the AOC. The following conditions are considered to be factors which were incorporated in the evaluation and design of the remediation method and approach presented herein for the Industrial Oven site:

- 1) There is sufficient evidence to show that the PCE source is situated on the property line which indicates that the release could have been caused by or originated from the historical chemical use and drum storage activities conducted in the northeast portion of the Ramser property along the fence line and may still exist to some degree on the adjacent Ramser property. Increasing concentrations of TCE in groundwater from west to east across the Ramser site and the presence of PCE on the east portion of the property suggests the potential of upgradient sources. Shallow soil at the Ramser property, however, has subsequently been significantly disturbed by new construction in 1998-1999 with shallow soil being removed, replaced, and capped during construction.

Based on this information, the remedial approach for the subject Industrial Oven AOC is not to use a vapor extraction system which may draw PCE and TCE contaminants into the AOC and to install a slurry barrier wall along the property line in the vicinity of the AOC. In addition, a remedial excavation approach would minimize any cross contamination from developing between the properties.